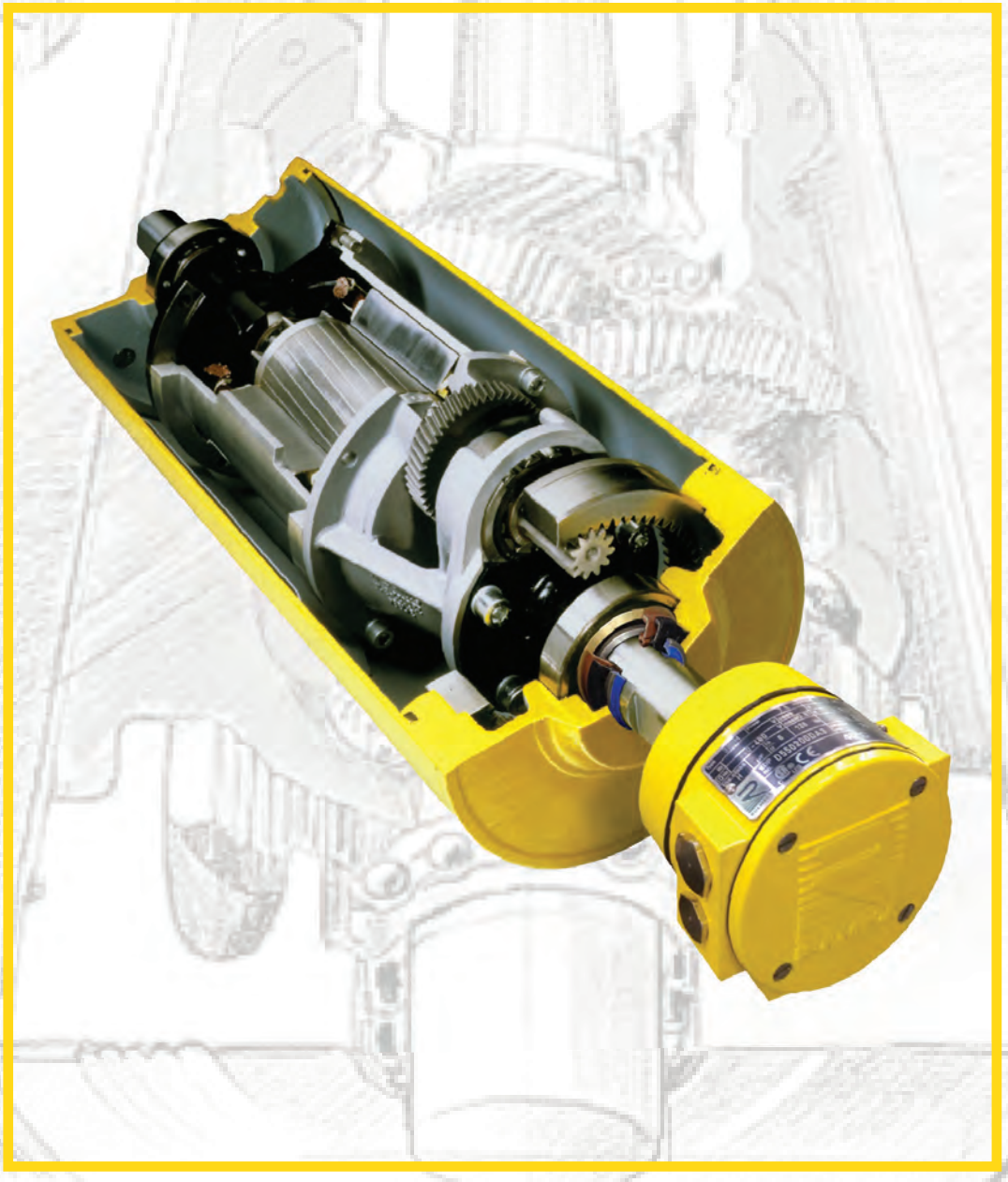
Motorized Pulleys for belt conveyors

RULMECA

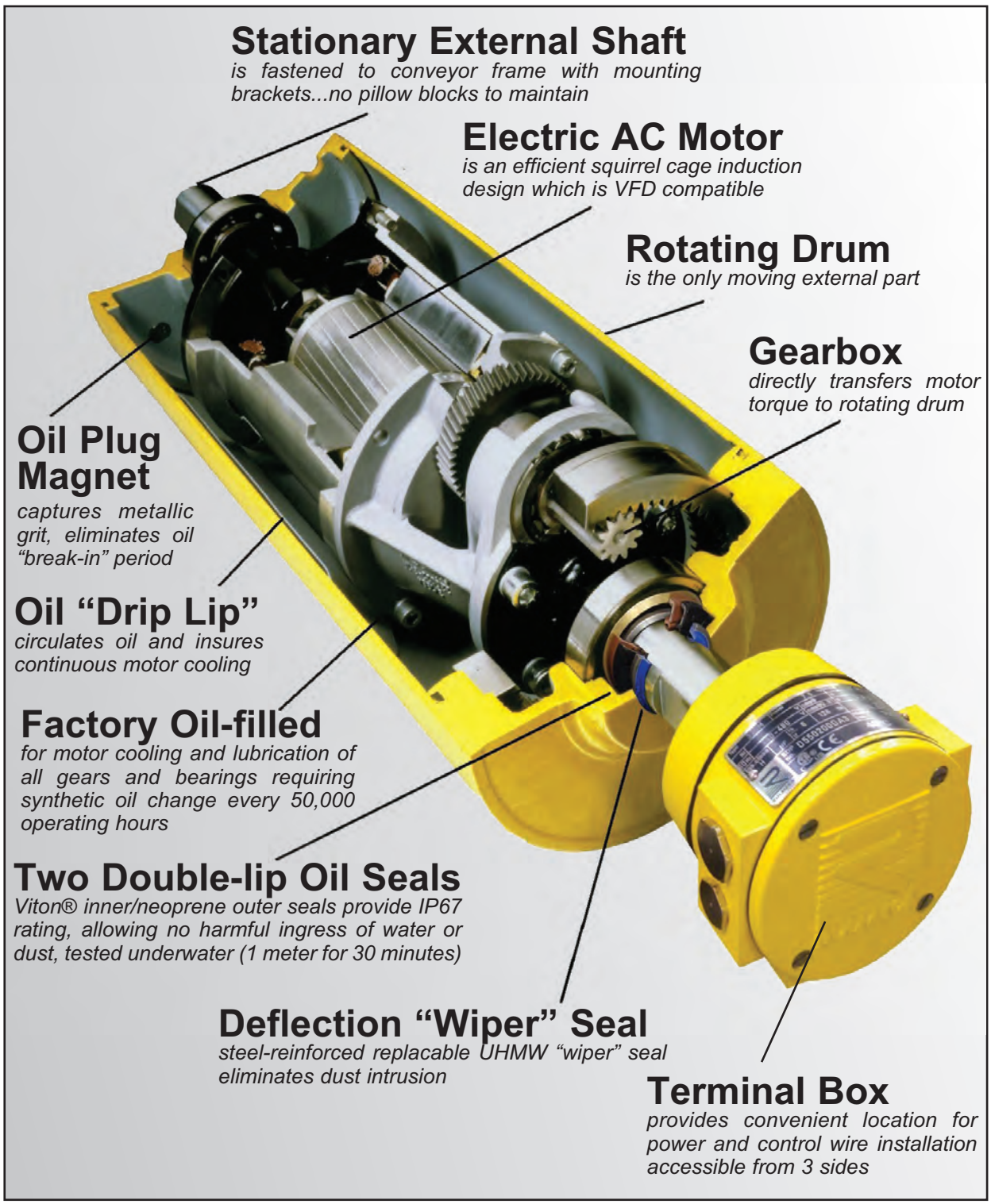
50 RULMECA 1962 2012



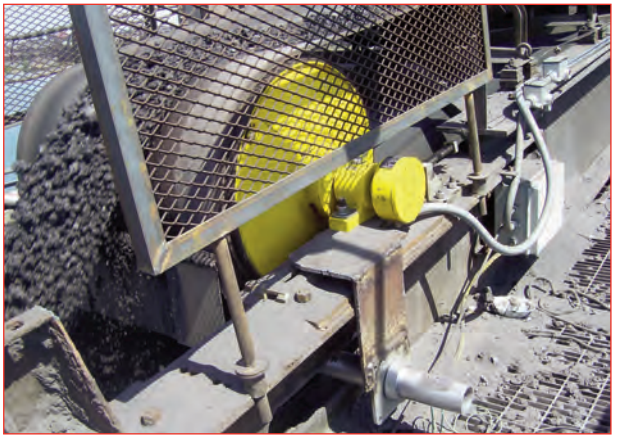
BULK HANDLING

TC101: 08/11

Rulmeca Motorized Pulley Cut-away View
Summary of Key Benefits



Cut away view of Motorized Pulley Model 220M.



Mobile and fixed plants for extraction, processing, loading...a Motorized Pulley's environment!

RULMECA GERMANY GmbH, Aschersleben, Germany - Rulmeca Motorized Pulley Manufacturing Facility.

CNC gear shaping

CNC gear hobbing system

Motor construction

Administrative offices

Plate rolling system for large diameter shells

Large Motorized Pulley shipment for North America

Motor and gearbox assembly

Table of Contents

Rulmeca Motorized Pulleys: a new name with deep roots

The Rulmeca Motorized Pulleys presented in this catalogue have a long history, beginning in the 1950's, when the product was developed in Germany and Denmark.

Eventually, through a merging process the German Förder und Antriebstechnik Aschersleben GmbH and the Danish John Kirkegaard Maskinfabrik A/S became partners in the Interroll Group.

From the early 1990's the manufacturing of all BULK Motorized Pulleys were centralized in Aschersleben, Germany.

In July 2003 Rulli Rulmeca S.p.A. purchased the production facility in Germany, where Motorized Pulleys have been developed and produced for almost half a century.

Today this plant, renamed Rulmeca Germany GmbH, continues the JOKI tradition for quality and reliability under the Rulmeca brand.

With this long history Rulmeca is a very experienced manufacturer of BULK Motorized Pulleys, offering the world's largest product range.

General Description

The Rulmeca Motorized Pulley was first produced in 1953 specifically for use on conveyor belt applications.

Until recently it was known as the JOKI Motorized Pulley or JOKI drum motor.

The objective was to produce a compact, hermetically sealed, highly efficient conveyor drive unit that would be unaffected by dust, water, oil, grease or other harmful substances. A Motorized Pulley that would be quick and simple to install and require virtually no maintenance.

The Rulmeca Motorized Pulley achieved this objective and today is considered to be one of the most reliable, effective and safe conveyor drive systems available throughout the world.

The Rulmeca Motorized Pulley is a highly efficient geared motor drive, which is hermetically sealed within a steel cylindrical shell.

The shell, which is normally crowned to ensure belt tracking, is fitted with bearing housings incorporating precision bearings and double lipped oils seals and rotates on a pair of fixed shafts.

The motor stator is fixed to the shafts and the motor winding cables pass through one of the shafts, eliminating the need for slip rings and brushes.

The squirrel cage induction motor, manufactured in steel laminate, is machined concentric to high tolerances and designed to give 200% starting torque for 3 phase versions.

The rotor pinion is coupled directly to the gearbox.

The gearbox transmits torque to the shell through a geared rim and allows very little frictional torque loss.

The Motorized Pulley is filled with oil, which acts as a lubricant and coolant. Heat is dissipated through the shell and conveyor belt.

All vital parts are CNC machined.

The Rulmeca Motorized Pulley is supplied as standard with:

- Machined mild steel crowned shell.
- Electric motor manufactured in accordance with IEC 34-1 (EN60034-1), (VDE 0530).
- Class H insulation according to IEC 34-1 (EN60034-1), (VDE 0530).
- Most international voltages.
- Stan. voltages supplied with +/-10% tolerance in accordance with IEC 38.
- Factory oil filled and tested.
- Degree of protection IP66/67 (EN60034-5).
- Motorized Pulleys are labelled in compliance with the Safety norm ANSI 535.4 and ISO 3864-2.

Rulmeca Motorized Pulleys are manufactured according to the Council Directives of the European Communities.

The CE-marking is according to Directive 73/23/EEC relating to electrical equipment and according to Directive 89/336EEC relating to electrical magnetic compatibility and amendments.

Features and Benefits of Rulmeca Motorized Pulleys

Purpose-built design
The Rulmeca Motorized Pulley has been specifically designed for belt conveyors.

Hermetically Sealed
The motor, gearbox and bearings are hermetically sealed inside a steel shell. Therefore they are unlikely to fail due to harmful environmental conditions such as water, dust, grit, chemicals, grease, oil, etc.

Space saving design
Because the drive unit and the bearings are mounted inside the Motorized Pulley shell, it requires much less room than an exposed drive. No need for costly extras like chains, v-belts, couplings, bearings, support structure and special guarding.

Safety
The Rulmeca Motorized Pulley is one of the safest drives available because the motor is completely enclosed and the external shafts are always stationary. The only moving external parts are the Motorized Pulley shell and bearing housings.

Low purchasing and installation cost
The Rulmeca Motorized Pulley is quite often less expensive than exposed drives because it has fewer parts. Therefore less conveyor design time and parts purchasing costs. It is also much quicker and easier to install - certainly less than a quarter of the time taken to fit an exposed system.

Low maintenance cost
The end user also benefits from the Rulmeca Motorized Pulley, because it requires no maintenance other than the recommended oil change every 50,000 operating hours for synthetic oil and oil seal change every 30,000 operating hours. That equates to 8 years between oil changes based on a 24 hrs/day and 7 day/week operating schedule. Mineral oil is also available requiring an oil change every 20,000 operating hours.

Efficiency
The Rulmeca Motorized Pulley usually has a much higher efficiency from electrical motor to shell (Pulley face) than exposed drives, because it has fewer frictional losses. Therefore, efficiencies of up to 97% can be achieved.

Cleanliness
Because the Rulmeca Motorized Pulley is hermetically sealed it cannot contaminate any conveying materials such as food, electrical components, plastics and other materials that must be kept perfectly clean during handling.

Aesthetic appearance
If installed correctly the Rulmeca Motorized Pulley always looks good. Due to its compact size and smooth lines, the Motorized Pulley is out of sight, because it is hidden within the conveyor frame.

Thermal protection
All three phase Rulmeca Motorized Pulleys are protected by our thermal protection switches. These heat-sensitive switches are built into the motor windings to protect the motor from overheating. The thermal protectors must be connected to a normally closed control circuit in order to protect the motor.

Weight saving and distribution
The Rulmeca Motorized Pulley is often lighter than exposed drives. It is possible to reduce the weight and cost of the conveyor structure, because the conveyor drive weight is evenly distributed within the conveyor frame.

Variable frequency drive
All Rulmeca Motorized Pulleys with 3 phase motors are easily controlled by variable frequency drives. See Technical Precautions.

Fewer parts
A Rulmeca Motorized Pulley consists of the Motorized Pulley and two fixing brackets! Exposed drives can require up to eight or more separate components, most of which have to be purchased from different suppliers or custom manufactured.

Low noise
Thanks to the totally sealed enclosure and high quality gears the Rulmeca Motorized Pulley runs almost at a whisper — a very important fact in today's modern factory environments.

The Rulmeca Motorized Pulley — the ideal drive unit for conveyors **"Fit it and forget it!"**

Bulk Materials Handling Engineering Principles

Introduction

Designers should use the following engineering principles in selecting the optimal belt conveyor drive for bulk handling applications. Refer to the latest edition of "Belt Conveyors for Bulk Materials," published by the Conveyor Equipment Manufacturers Association (CEMA) for a comprehensive design guide.

Design Parameters

Determine desired design parameters:

- product flow rate (Q)
- belt speed (V)
- belt width (w)
- conveyor length (L)
- product size
- lift height (H)
- type & thickness of belt
- type of belt support

Make the following control choices:

- continuous or intermittent flow
- fixed or variable belt speed
- conveyor duty cycle
- extremes of process flow
- ambient environment extremes
- applicable safety requirements

Optimize Belt Speed & Belt Width

Select Belt Width:

- with bulk density & belt speed fixed, select width to yield product flow rate, not exceeding CEMA "standard edge distance"
- width must be ≥ 3x max lump for 20 º surcharge and ≥ 6x max lump for 30 º surcharge
- width must be wide enough to prevent loading chute and skirtboard jamming (i.e. ≥ 3x to 5x max lump)

Select Belt Speed:

- with bulk density & width fixed, select speed to yield product flow rate, not exceeding CEMA "standard edge distance"
- for dusty material, select speed to minimize fugitive emissions
- for heavy sharp material, select speed to protect belt and chute lining

Calculate Power to Drive Belt

CEMA has empirically developed a variety of factors to simply the determination of belt pull. Some of these factors include: idler roller bearing friction (Kx,) belt and load flexure resistance (Ky,) and skirtboard friction (Tsb.) To determine required HP calculate required belt pull at specified belt speed as follows:

- with belt width and speed fixed, select conveyor components and calculate belt tension (Te) required to overcome gravity, friction, and momentum using:
  Te = LKt (Kx + KyWb + 0.015Wb)
  + Wm (LKy + H) + Tp + Tam + Tac
- calculate power required to drive belt using:
  HP = (TeV) / 33,000

Go to www.rulmecacorp.com for free "downloadable" conveyor design software incorporating equations above and a complete set of definitions for all pertinent terminology.

Select Drive & Check Geometry

Finally, select conveyor drive and check design using final parameters as follows:

- select Motorized Pulley to match design belt speed and required HP
- check selected pulley diameter verifying that wrap factor and belt life are acceptable
- recalculate required belt pull and HP using selected "actual belt speed"
- check material cross section on belt verifying that edge distance is acceptable
- check material trajectory verifying that transfer chute will not plug and material will drop at desired location

Go to www.rulmecacorp.com for free "downloadable" conveyor design software incorporating material cross section and trajectory plotting programs and pulley diameter check.

Special Loading Conditions

Certain loading are beyond the scope of the 5th Edition of the CEMA manual.

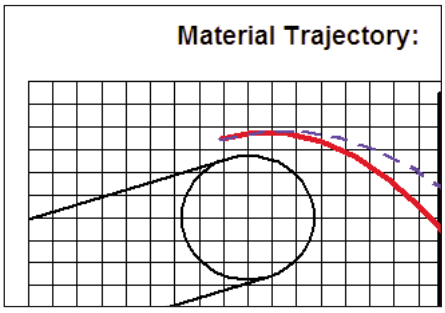
These include:

- hopper feeder conveyors
- slider bed conveyor supports
- cleated and/or sidewall belt

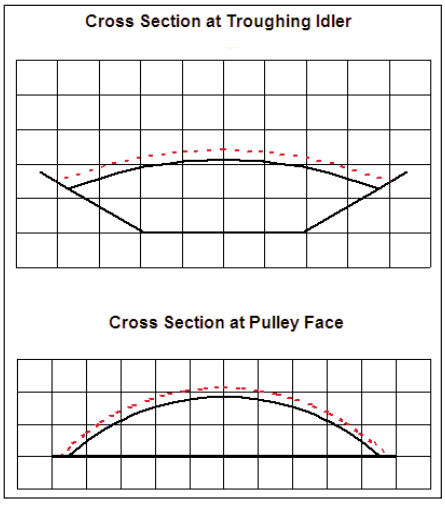
Go to www.rulmecacorp.com for free "downloadable" conveyor design software incorporating HP calculations for these special conditions.

Examples

The drawings below were generated by Rulmeca design software and illustrate how the programs can help designers avoid errors.



Trajectory plot shows that slower belt speed (solid line) will not plug chute while faster belt speed (dotted line) will. This is because trajectory of center of material mass impacts against vertical chute wall above horizontal centerline of pulley.



Plot shows that selected belt speed (dotted line) may cause material spillage because cross section exceeds CEMA recommendation (solid line.)

APPLICATION WORKSHEET - BULK MATERIALS HANDLING
Motorized Pulleys

Complete this form and submit to Rulmeca for a power calculation and Motorized Pulley recommendation.

Contact Person _____ **Date** _____ **Ref #** _____

Company _____

Address _____

Phone _____ **Fax** _____ **Email** _____

Standard Loading Conditions:

Conveyor Length (ft) _____
Tonnage Rate (tph) _____
Belt Speed (fpm) _____
Material Lift Height (ft) _____
Ambient Temperature (ºF) Min _____
Ambient Temperature (ºF) Max _____
Initial Velocity of Material (fpm) _____
Number of Belt Cleaners _____
Number of Belt Plows _____
Length of Skirt Zone (ft) _____
Depth of Material in Skirt Zone (in) _____
Number of Non-driven Pulleys _____

Elevation (ft)	Idler Roll Diam. (in)	Type of Lagging
☐ 3,300 ☐ 5,000 ☐ 6,600	☐ 3 ☐ 4 ☐ 5 ☐ 6	☐ Full ☐ Partial ☐ None
Belt Width (in)	**CEMA Type**	**Type of Take-up**
☐ 18 ☐ 24 ☐ 30 ☐ 36 ☐ 42 ☐ 48 ☐ 54 ☐ 60 ☐ 66 ☐ 72 ☐ 84 ☐ 96 ☐ Other _____	☐ A ☐ B ☐ C ☐ D ☐ E	☐ Automatic ☐ Manual
	Troughing Idler Spacing (ft)	**Angle of Wrap (deg)**
	☐ 3.0 ☐ 3.5 ☐ 4.0 ☐ 4.5 ☐ 5.0	☐ 180 ☐ 200 ☐ 210 ☐ 220 ☐ 240 ☐ 360

Type of Belt

☐ 1 ply, 160 piw
☐ 2 ply, 225 piw
☐ 3 ply, 330 piw
☐ 4 ply, 440 piw

Belt Carcass

☐ fabric
☐ steel cord

Material (frictional coefficient)	
☐ ashes, coal, dry	0.0571
☐ bauxite, ground	0.1881
☐ cement, Portland, dry	0.2120
☐ cement clinker	0.1228
☐ clay, ceramic, dry fines	0.0924
☐ coal, bituminous mined	0.0754
☐ coke, ground fine	0.0452
☐ cullet (broken glass)	0.0836
☐ grains, wheat, corn, rye	0.0433
☐ gravel, bank run	0.1145
☐ iron ore, 200 lbs/cu ft	0.2760
☐ limestone, pulverized dry	0.1280
☐ phosphate rock, dry	0.1086
☐ salt, common, dry fine	0.0814
☐ sand, dry, bank	0.1378
☐ wood chips	0.0095

Material Bulk Density (pcf)	
☐ ashes, coal, wet	50
☐ bagasse	10
☐ bark, wood	20
☐ bauxite, ground, dry	68
☐ bauxite, crushed	85
☐ beans, navy, dry	48
☐ beets, whole	48
☐ borax, 3" & under	70
☐ cement, portland	99
☐ clay, ceramic, dry, fines,	80
☐ clay, dry, fines	120
☐ coal, bituminous	55
☐ coal, lignite	45
☐ coke,	45
☐ corn, ear,	56
☐ cullet,	120
☐ gravel, bank run,	100
☐ iron ore,	200
☐ iron ore pellets	130
☐ limestone, crushed	90
☐ paper pulp stock	60
☐ phosphate rock	85
☐ potash salts	80
☐ rock, crushed,	145
☐ rock, soft,	110
☐ rye,	46
☐ sale, common dry, fine,	80
☐ sand, bank, damp,	130
☐ sand, bank, dry,	110
☐ sand, foundry,	100
☐ sawdust	13
☐ sewage sludge, moist,	55
☐ soybeans, whole,	50
☐ sugar, raw, cane,	65
☐ taconite pellets	130
☐ traprock, 2-3" lumps,	110
☐ wheat, cracked,	45
☐ wood chips	30

Operating Conditions:

Duty Cycle (Start/stops per hour) _____
Hours of Operation (hrs/day) _____
Days of Operation (days/week) _____
Is this a reversing belt? _____
Additional Comments: _____

Special Loading Conditions:

Hopper Feeder Parameters:
Hopper Opening Width (in) _____
Hopper Opening Length (in) _____

Slider Bed Parameters:
Slider Bed Length (ft) _____

Slider Bed Material (frictional coefficient)	
☐ steel	0.90
☐ UHMW polyethylene	0.545
☐ urethane	0.88
☐ wood	1.00

Sidewall & Cleated Belt Parameters:
Sidewall & cleat height (in) _____
Thickness of sidewall (in) _____
Distance between cleats (in) _____
Thickness of cleats (in) _____

Tripper Design Parameters:
Tripper Length (ft) _____
Tripper Material Lift Height (ft) _____
Number of Tripper Belt Cleaners _____
Tripper Skirt Zone Length (ft) _____
Depth of Material in Skirt Zone (in) _____
No. of Tripper Non-driven Pulleys _____

For free "downloadable" power calculation program, complete with definitions of all terminology, go to www.rulmecacorp.com.

Motorized Pulley 138E, Ø 5.45 in. (138 mm)

Motorized Pulley 138E, with machined helical gearbox, performs with a gearbox efficiency of 95% of nominal power, in a compact diameter of 5.45 inches. With a minimum roller length (RL) of 11.81" and powers ranging from 0.13 to 1.0 HP, this Motorized Pulley is suitable for most small diameter applications. These include:

- **Light agricultural conveyors**
- **Light C & D debris conveyors**
- **Mobile and portable conveyors**

Motorized Pulley 138E features a standard enclosure class of IP66/67 and is also available in stainless steel for wash down applications.

STANDARD SPECIFICATION of Motorized Pulley

- Crowned mild steel 5.45" shell treated with anti-rust wax
- Die cast aluminum bearing housing
- Mild steel shaft treated with anti-rust wax
- Die cast lightweight aluminum gearbox housing
- Sealing system — degree of protection IP66/67 (EN60034-5.) See page 37.
- Compact die cast aluminum terminal box with WAGO connectors
- Voltage: All common voltages available. Please specify.
- Three phase induction motor
- One out of two oil plugs is fitted with a magnet to filter the oil.
- Motor winding insulation class H
- Dynamically balanced rotor
- Oil change recommended every 50,000 operational hours for synthetic oil (or 20,000 operational hours for mineral oil.)
- Maximum RL 70.87"
- Non standard RL lengths available
- Single phase is available in 0.33, 0.50, and 0.75 HP, supplied with a running capacitor
- To be used in the horizontal position only.

STAINLESS STEEL options

TS7N

- Stainless steel shell — AISI 304 range
- Stainless steel shafts — AISI 303 range
- Stainless steel covered aluminum bearing housings — AISI 304 range
- Stainless steel oil plugs with magnet — AISI 304 range
- Compact stainless steel terminal box — AISI 304 range
- Alternatively, straight stainless steel connector — AISI 303 range with power cord.
- Regreasable stainless steel seals — AISI 303 range
- Degree of protection IP66/67 (EN60034-5.) See page 37.
- FDA & USDA food grade grease
- Option: FDA & USDA food grade recognized oil.
- Special mounting brackets are available

Please note:

- **Noise-sensitive Areas:** High speed 2-pole motors can cause higher noise levels and are not recommended for noise-sensitive areas
- **Technical Precautions for Design, Installation, and Maintenance:** pages 78-98.
- **Environmental Considerations:** page 76-77.
- **Optional Extras:** pg 7 and back cover
- **Electrical Connection Diagrams:** pages 92-98.

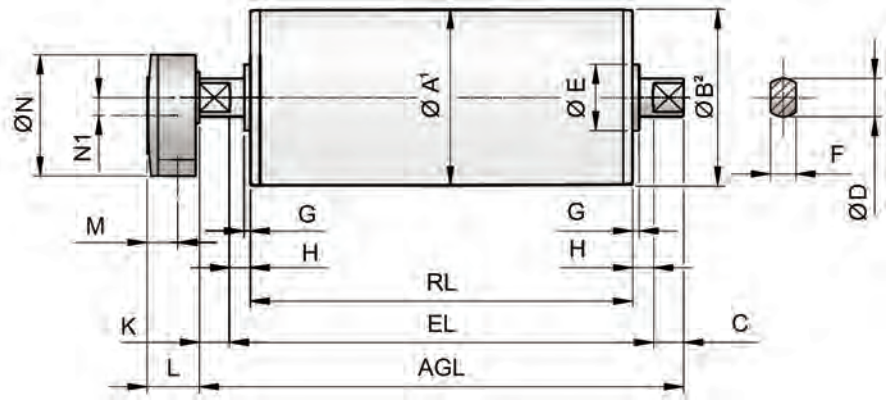
OPTIONAL EXTRAS
Motorized Pulley 138E

Specification		Availability
Total stainless steel option AISI 304 range	TS7N with regreasable labyrinth seals	x
Food grade oil & grease - FDA & USDA recognized		x
Dust explosion proof Motorized Pulleys - ATEX 95 - Zone 22 - for applications handling dusty grain etc. According to European Directive 94/9/EC.		o
Total acid resistant stainless steel option - AISI 316		x
Black rubber lagging - Standard specifications (See page 82-83.) 1/8" smooth lagging - Hardness 60 ±5 Shore A		o
White smooth rubber lagging (FDA). Oil, fat & grease resistant		o
Special lagging (e.g. hot vulcanized)		o
Electromagnetic brake	Min. RL increases by 1.97"	x
Mechanical backstop	Min. RL does not increase with backstop option	x
Modified for vertical mounting		o
Modified for mounting between 5° and 90° (e.g. for magnetic separators)		o
Insulation class F with standard oil: (Allowable ambient temperature: -13°F/+104°F)		x
Insulation class H with synthetic oil: (Allowable ambient temperature: -13°F/+120°F)		Std.
Special motors for applications with no belt contact		o
Low noise drives for noise sensitive areas		x
Parallel shell		x
Thermal protector		Std.
IP66/67 Compact unpainted aluminum terminal box		Std.
IP66/67 Compact stainless steel terminal box- AISI 304 or 316 range		x
Straight or elbow connector with standard power cord		x
Straight connector with screened power cord	(See page 86 for VFD precautions)	x
Straight connector with standard power cord	(Stainless steel in AISI 304 range)	x
Voltage: single voltage (460) stator (Y winding) wired for 460v/3ph/60 Hz at terminal box		Std.
single voltage (230) stator (Y winding) wired for 230v/3ph/60 Hz at terminal box		x
2 speed motors		x
Special voltage motors		x
Single phase motors		o
CSA approved motors		o

x = Optional extra's
o = An option with certain limitations. Please refer to Technical precautions pages 78-98.
Std. = Fitted as standard

Motorized Pulley 138E, Ø 5.45 in. (138 mm)

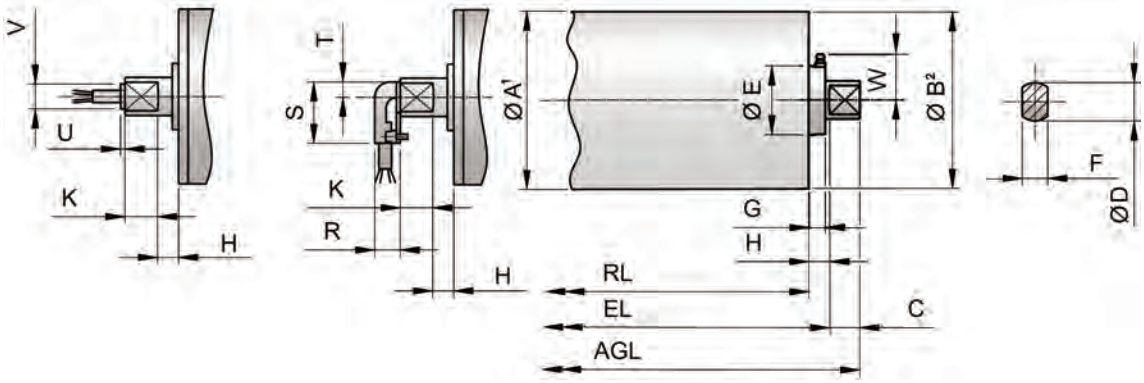
Motorized Pulley with Terminal box



Motorized Pulley with cable straight connector

Elbow connector (not for TS7N)

Idler Pulley[3] TS7N version

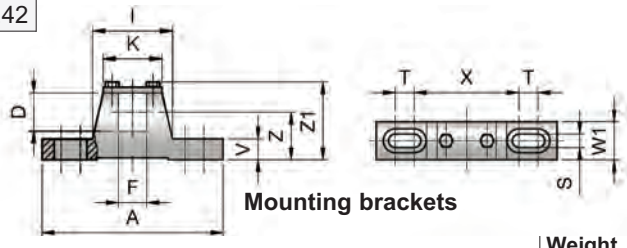


Model	Motorized Pulley or idler Pulley (UT) A in	B in	C in	D in	E in	F in	G in	H in	K in	W in	Compact terminal box L in	M in	N in	N1 in	Straight connector U in	V in	Elbow connector R in	S in	T in
138E	5.45	5.39	0.93	1.18	2.13	0.79	0.20	0.65	0.93	—	1.61	0.95	3.74	0.55	0.14	0.77	0.79	1.89	0.47
UT138E	5.45	5.45	0.93	1.18	2.13	0.79	0.53	0.65	—	1.42									

1 A dimension is outer diameter of unlagged pulley shell at pulley centerline.

2 B dimension is outer diameter of unlagged pulley shell at each end of shell.

3 Idler pulley shown is non-crowned TS7N version with regreasable seals.



Mounting brackets

Motorized Pulleys Model	Material	Bracket Size	Part Number	Dimensions A in	D in	F in	I in	K in	S in	T in	V in	W1 in	X in	Z in	Z1 in	Weight lbs
138E	Cast iron painted	KL30	S2YAKL	7.09	1.18	0.79	3.39	2.24	0.43	0.67	0.47	0.95	4.33	1.75	2.83	1.54
	Cast iron Ni plated		S2YAKM													
	Stainless steel		S3KL33													

Motorized Pulley 138E, Ø 5.45 in. (138 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL_{max} = 70.87") Weight in lbs[5]										Type of Bracket
Power HP	No. of Poles								11.81	12.60	13.78	15.75	17.72	19.69	21.65	23.62	25.59	longer than 25.59	
0.13	12	3	138E	10 12 14	10 14 16	397 318 263	1,066	11.81	32	33	34	37	40	42	44	46	49	See Foot-note[4]	KL30 S2YAKL
		2	138E	24 30	24 28	178 152													
0.25	8	3	138E	18 24 30	20 24 29	384 309 254													
		2	138E	38 48	44 51	172 147													
0.33	6	3	138E	24 30 38	25 31 38	404 325 265													
		2	138E	48 60 76	55 65 82	182 155 124													
0.50	4	3	138E	38 48 60	38 47 58	412 331 273													
		2	138E	76 96 120 150	85 98 123 150	185 158 126 104													
0.75	2	3	138E	48 60 76 96 120	55 64 74 93 113	416 363 310 249 205													
		2	138E	150 192 240 300	166 196 244 296	139 119 95 78													
1.0	4	3	138E	76 96 120 150	88 104 129 157	357 304 244 201		12.60	-	34	37	41	43	45	47	49	53		
	2	2	138E	192 240 300	207 258 314	152 122 100													
										Standard RL →									
Idler Pulley			Model UT138E				1,066	11.81	15	16	18	21	23	25	27	29	32	See Foot-note[4]	KL30 S2YAKL

1 Use “nominal belt speed” to specify pulley. “Actual belt speed” is presented (for pulley lagged with 1/8” thick rubber) to assist with process design calculations. See Technical Precautions page 79. Note that “actual belt speed” decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding “Maximum radial load” defined above. See “Belt Tension” section in Technical Precautions, page 80.

4 Additional Motorized Pulley and Idler Pulley weight, specified per Roller Length:
25.59”≤ RL < 39.37” Wt = 1.3 lbs/inch
39.37”≤ RL < 59.06” Wt = 1.5 lbs/inch
59.06”≤ RL < 70.87” Wt = 2.0 lbs/inch

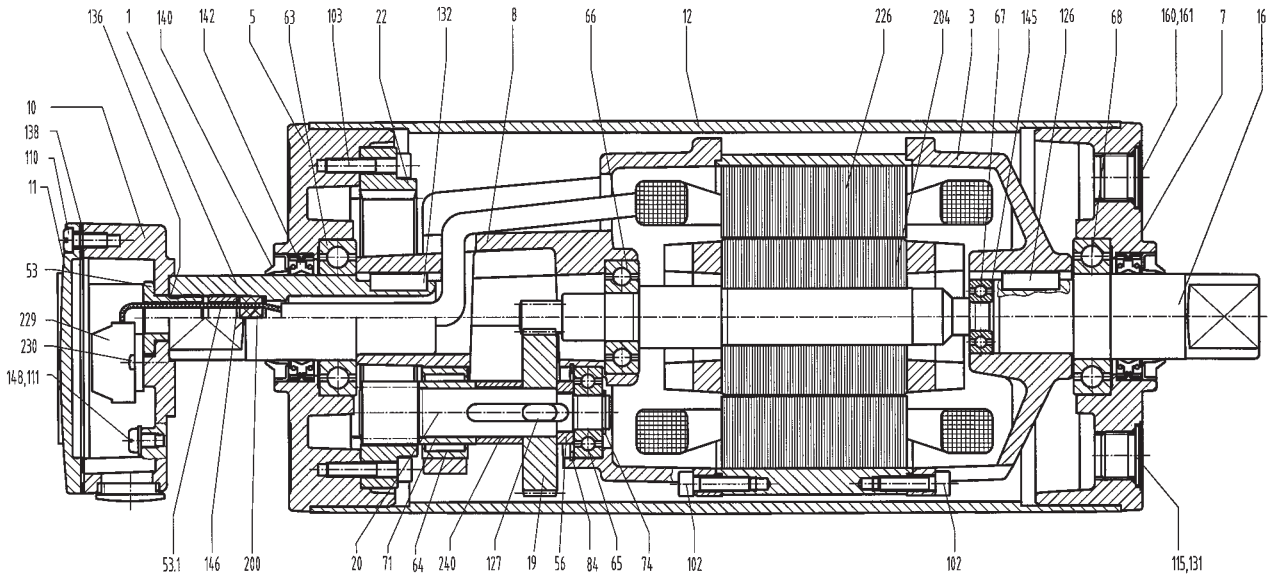
5 All weights shown above are for pulleys with 1/8” thick rubber lagging and do not include mounting bracket. To calculate unlagged pulley weight subtract 0.1 lbs/in of Roller Length from above.

Motorized Pulley 138E, Ø 5.45 in. (138 mm)

Spare parts list and sectional drawings

Pos.	Description	Pos.	Description	Pos.	Description
1	Front shaft	31	Labyrinth seal cover	110	Screw
3	Rear flange	53	Nipple (terminal box	111	Screw
5	Bearing housing complete with geared rim	53.1	Cable seal nipple (cable option)	113	Screw
		55	Spacer bushing	114	Socket set screw
7	Bearing housing complete	56	Spacer bushing	115	Oil plug with magnet
8	Gearbox	63	Ball bearing	126	Key
10	Terminal box — bottom part	64	Needle bearing	127	Key
11	Terminal box cover	65—70	Ball bearing	131	Key
12	Shell	71	Inner race	132	Key
16	Rear shaft	74	Locking ring	136	O-ring/Rubber seal
19	Input wheel	84	Locking ring	138	Rubber seal
20	Output pinion	86	Locking ring	139	Grease nipple
22	Geared rim	93	Elbow or straight connector	140	Deflection seal
23	Intermediate pinion shaft	102	Screw	142	Double lip seal
24	Intermediate wheel	103	Screw	143	O-ring

2-stage gearbox

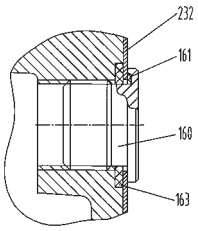


Motorized Pulley 138E, Ø 5.45 in. (138 mm)

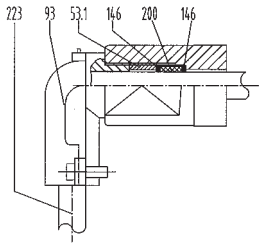
Spare parts list and sectional drawings

Pos.	Description	Pos.	Description	Pos.	Description
145	Distance washer	160	Oil plug	208	Stainless steel cover — gear end
146	Washer	161	O-ring		
148	Washer	163	O-ring	210	Fixing guard
150	Electromagnetic brake	167	Screw	223	Cable
150.1	Friction disc	200	Rubber seal	226	Stator complete
156	Rectifier (not shown)	204	Rotor complete with pinion	240	Distance ring

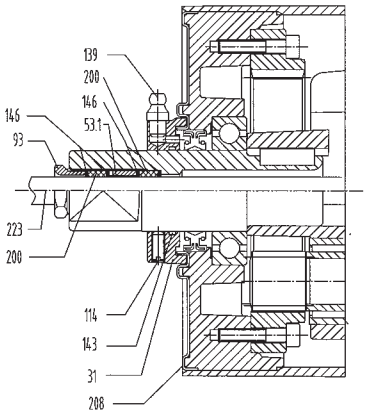
TS7N with cable connection



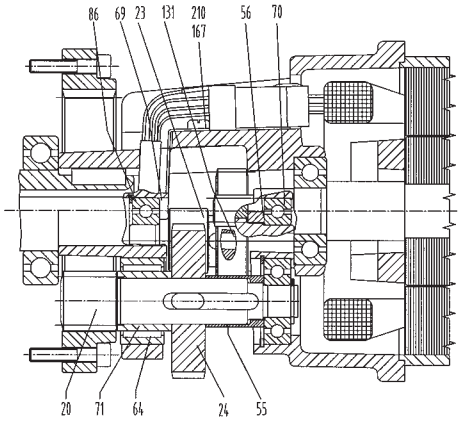
Elbow connector



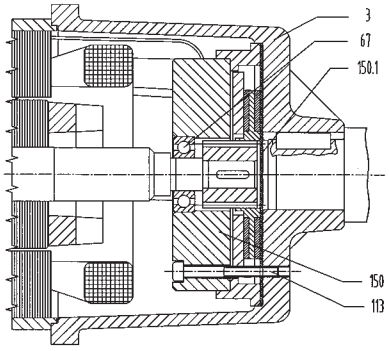
TS7N with cable connection



3-stage gearbox



Electromagnetic brake



Motorized Pulley 165E, Ø 6.49 in. (165 mm)

Motorized Pulley 165E, with machined helical gearbox, performs with a gearbox efficiency of 95% of nominal power, in a compact diameter of 6.49 inches. With a minimum roller length (RL) of 15.75" and powers ranging from 0.15 to 3.0 HP, this Motorized Pulley is suitable for most small diameter applications. These include:

- **Light agricultural conveyors**
- **Light C & D debris conveyors**
- **Mobile and portable conveyors**

Motorized Pulley 165E features a standard enclosure class of IP66/67 and is also available in stainless steel for wash down applications.

STANDARD SPECIFICATION of Motorized Pulley

- Crowned mild steel 6.49" shell treated with anti-rust wax
- Die cast aluminum bearing housing
- Mild steel shaft treated with anti-rust wax
- Die cast lightweight aluminum gearbox housing
- Sealing system — degree of protection IP66/67 (EN60034-5.) See page 37.
- Compact die cast aluminum terminal box with WAGO connectors
- Voltage: All common voltages available. Please specify.
- Three phase induction motor
- One out of two oil plugs is fitted with a magnet to filter the oil.
- Motor winding insulation class H
- Dynamically balanced rotor
- Oil change recommended every 50,000 operational hours for synthetic oil (or 20,000 operational hours for mineral oil.)
- Maximum RL 70.87"
- Non standard RL lengths available.
- To be used in the horizontal position only.

STAINLESS STEEL options

TS7N

- Stainless steel shell — AISI 304 range
- Stainless steel shafts — AISI 303 range
- Stainless steel covered aluminum bearing housings — AISI 304 range
- Stainless steel oil plugs with magnet — AISI 304 range
- Compact stainless steel terminal box — AISI 304 range
- Alternatively, straight stainless steel connector — AISI 303 range with power cord.
- Regreasable stainless steel seals — AISI 303 range
- Degree of protection IP66/67 (EN60034-5.) See page 37.
- FDA & USDA food grade grease
- Option: FDA & USDA food grade recognized oil.
- Special mounting brackets are available.

Please note:

- **Noise-sensitive Areas:** High speed 2-pole motors can cause higher noise levels and are not recommended for noise-sensitive areas
- **Technical Precautions for Design, Installation, and Maintenance:** pages 78-98.
- **Environmental Considerations:** page 76-77.
- **Optional Extras:** pg 13 and back cover
- **Electrical Connection Diagrams:** pages 92-98.

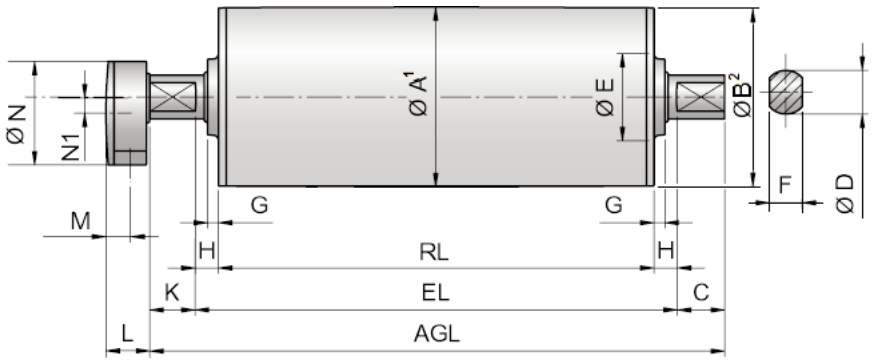
OPTIONAL EXTRAS
Motorized Pulley 165E

Specification		Availability
Total stainless steel option AISI 304 range	TS7N with regreasable labyrinth seals	x
Food grade oil & grease - FDA & USDA recognized		x
Dust explosion proof Motorized Pulleys - ATEX 95 - Zone 22 - for applications handling dusty grain etc. According to European Directive 94/9/EC.		o
Total acid resistant stainless steel option - AISI 316		x
Black rubber lagging - Standard specifications (See page 82-83.) 1/8" smooth lagging - Hardness 60 ±5 Shore A		o
White smooth rubber lagging (FDA). Oil, fat & grease resistant		o
Special lagging (e.g. hot vulcanized)		o
Electromagnetic brake	Min. RL increases by 1.97"	x
Mechanical backstop	Min. RL does not increase with backstop option	x
Modified for vertical mounting		o
Modified for mounting between 5° and 90° (e.g. for magnetic separators)		o
Insulation class F with standard oil: (Allowable ambient temperature: -13°F/+104°F)		x
Insulation class H with synthetic oil: (Allowable ambient temperature: -13°F/+120°F)		Std.
Special motors for applications with no belt contact		o
Low noise drives for noise sensitive areas		x
Parallel shell		x
Thermal protector		Std.
IP66/67 Compact unpainted aluminum terminal box		Std.
IP66/67 Compact stainless steel terminal box- AISI 304 or 316 range		x
Straight or elbow connector with standard power cord		x
Straight connector with screened power cord	(See page 86 for VFD precautions)	x
Straight connector with standard power cord	(Stainless steel in AISI 304 range)	x
Voltage: single voltage (460) stator (Y winding) wired for 460v/3ph/60 Hz at terminal box		Std.
single voltage (230) stator (Y winding) wired for 230v/3ph/60 Hz at terminal box		x
Special voltage motors		x
CSA approved motors		x

x = Optional extra's
o = An option with certain limitations. Please refer to Technical precautions pages 78-98!
Std. = Fitted as standard

Motorized Pulley 165E, Ø 6.49 in. (165 mm)

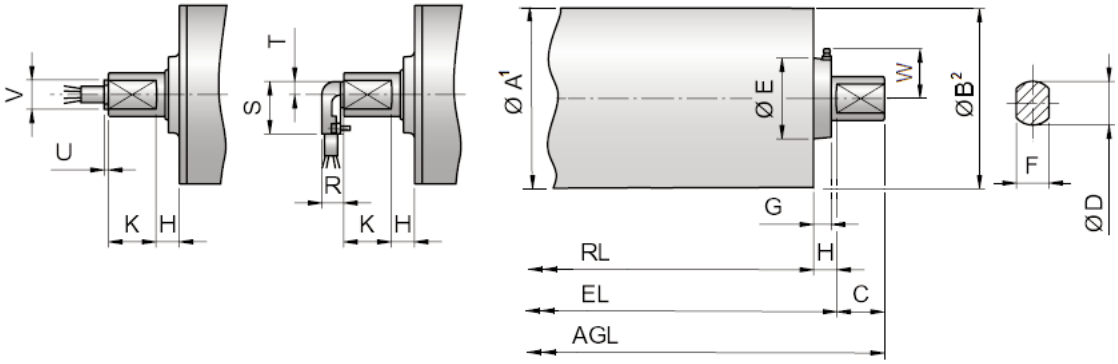
Motorized Pulley with Terminal Box



Motorized Pulley with cable straight connector

Elbow connector (not for TS7N)

Idler Pulley[3] TS7N version

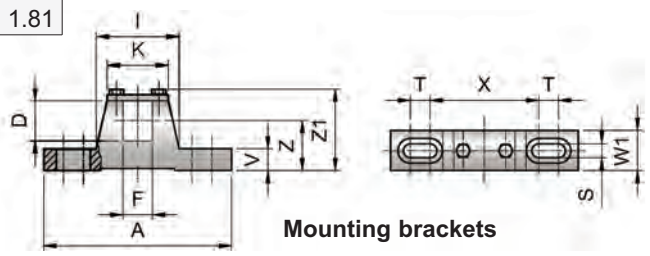


Model	Motorized Pulley or idler Pulley (UT) A in	B in	C in	D in	E in	F in	G in	H in	K in	W in	Compact terminal box L in	M in	N in	N1 in	Straight connector U in	V in	Elbow connector R in	S in	T in
165E	6.49	6.44	1.71	1.57	3.15	1.18	0.39	0.85	1.63	—	1.61	0.95	3.74	0.55	0.16	1.06	0.79	1.89	0.47
UT165E	6.49	6.49	1.71	1.57	2.95	1.18	0.65	0.85	—	1.81									

1 A dimension is outer diameter of unlagged pulley shell at pulley centerline.

2 B dimension is outer diameter of unlagged pulley shell at each end of shell.

3 Idler pulley shown is non-crowned TS7N version with regreasable seals.



Mounting brackets

Motorized Pulleys Model	Material	Bracket Size	Part Number	Dimensions A in	D in	F in	I in	K in	S in	T in	V in	W1 in	X in	Z in	Z1 in	Weight lbs
165E	Steel painted	KL41-HD	6YA0K	7.48	1.57	1.18	3.31	2.44	0.55	0.79	0.87	1.57	4.33	1.97	3.27	4.63
	Steel Ni plated		6YA0W													
	Stainless steel		6YA0U													

Motorized Pulley 165E, Ø 6.49 in. (165 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL_{max} = 70.87") Weight in lbs[5]									Type of Bracket
Power HP	No. of Poles								15.75	17.72	19.69	21.65	23.62	25.59	27.56	29.53	31.50	longer than 31.50	
0.15	12	3	165E	12 14 18 24	14 16 20 26	351 288 233 177	2,097	15.75	66	69	72	76	78	80	83	87	90	See Footnote[4]	KL41-HD 6YA0K
0.50	6	3	165E	24 30	25 30	624 512			68	71	75	78	80	83	86	89	92		
	4	3	165E	38 48 60 76 96	37 48 59 77 98	414 328 265 202 160			64	67	70	73	76	78	81	84	88		
		2	165E	120 150 192	123 152 199	126 102 78													
				240	251	62	1955												
1.00	4	3	165E	38 48 60 76 96	38 48 59 77 98	810 664 537 409 325	2097		70	74	77	80	82	84	88	91	94		
		2	165E	120 150 192	123 152 199	256 207 158													
				240	251	125	1955												
1.50	4	3	165E	60	66	730	2097		75	78	81	84	87	89	92	95	99		
	2	3	165E	76 96 120 150 192	81 99 123 161 203	569 467 378 288 228													
		2	165E	240 300	257 318	180 145	1955												
				384 480 600	416 525 646	111 88 74	1562												
2.00	2	3	165E	120 150 192	123 161 203	515 393 311	2097		77	80	83	87	89	91	94	98	101		
		2	165E	240 300	257 318	246 198	1955												
				384 480 600 768	416 525 651 787	151 120 105 88	1562												
3.00	2	3	165E	120 150 192	132 161 192	717 588 466	2097	17.72	-	84	87	91	93	95	98	102	105		
		3	165E	240 300	250 302	378 314	1955												
		2	165E	384 480 600 768	417 527 648 783	227 180 146 121	1562												
										Standard RL →									
Idler Pulley			Model UT165E				2,097	15.75	33	35	39	43	45	47	50	54	58	See Footnote[4]	KL41-HD 6YA0K

1 Use “nominal belt speed” to specify pulley. “Actual belt speed” is presented (for pulley lagged with 1/8” thick rubber) to assist with process design calculations. See Technical Precautions page 79. Note that “actual belt speed” decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding “Maximum radial load” defined above. See “Belt Tension” section in Technical Precautions, page 80.

4 Additional Motorized Pulley and Idler Pulley weight, specified per inch of Roller Length:
- 31.50”≤ RL < 45.28” Wt = 1.5 lbs/in
- 45.28”≤ RL < 64.96” Wt = 2.1 lbs/in
- 64.96”≤ RL < 70.87” Wt = 2.9 lbs/in

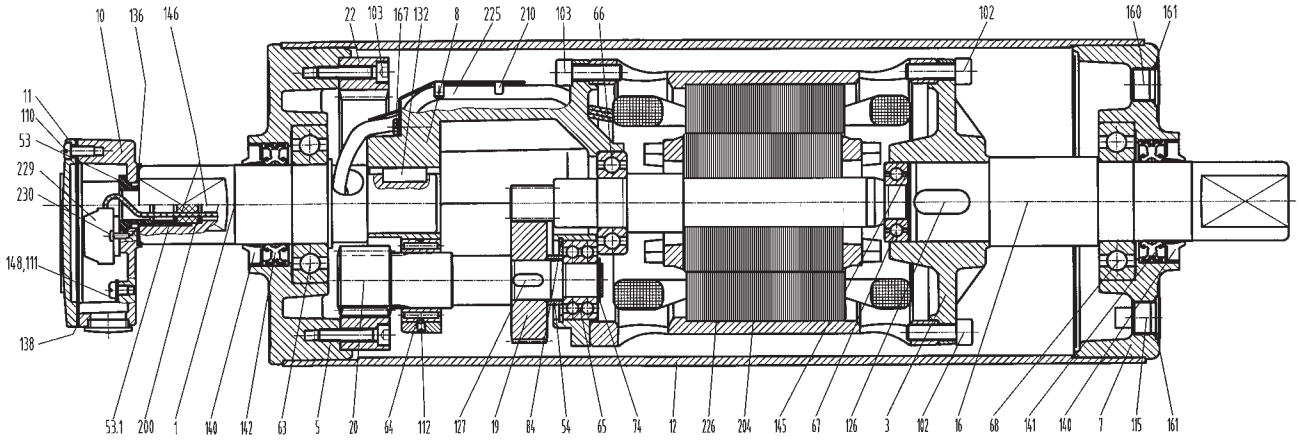
5 All weights shown above are for pulleys with 1/8” thick rubber lagging and do not include mounting brackets. To calculate unlagged pulley weight subtract 0.1 lbs/in of Roller Length from above.

Motorized Pulley 165E, Ø 6.49 in. (165 mm)

Spare parts list and sectional drawings

Pos.	Description	Pos.	Description	Pos.	Description
1	Front shaft	53	Cable seal nipple (cable option)	102	Screw
3	Rear flange	53.1	Nipple (terminal box)	103	Screw
5	Bearing housing complete with geared rim	55	Spacer bushing	110	Screw
		56	Spacer bushing	111	Screw
7	Bearing housing complete	63	Ball bearing	112	Socket set screw
8	Gearbox	64	Needle bearing	113	Screw
10	Terminal box — bottom part	65—70	Ball bearing	114	Socket set screw
11	Terminal box cover	71	Inner race	115	Oil plug with magnet
12	Shell	73	Locking ring	126	Key
16	Rear shaft	74	Locking ring	127	Key
19	Input wheel	74	Locking ring	131	Key
20	Output pinion	81	Locking ring	132	Key
22	Geared rim	84	Locking ring	136	O-ring/Rubber seal
23	Intermediate pinion shaft	85	Locking ring	138	Rubber seal
24	Intermediate wheel	86	Locking ring		
31	Labyrinth seal cover	93	Elbow or straight connector		

2-stage gearbox



Motorized Pulley 165E, Ø 6.49 in. (165 mm)

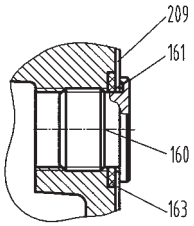
Spare parts list and sectional drawings

Pos.	Description
139	Grease nipple
140	Deflection seal
141	Double lip seal
142	Double lip seal
143	O-ring
145	Distance washer
146	Washer
148	Washer
150	Electromagnetic brake
150.1	Friction disc

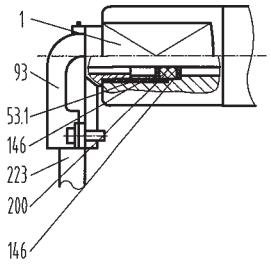
Pos.	Description
156	Rectifier (not shown)
160	Oil plug
161	O-ring
163	O-ring
167	Screw
200	Rubber seal
204	Rotor complete with pinion
206	Insulated sleeve for wire protection
208	Stainless steel cover — gear end

Pos.	Description
209	Stainless steel cover — oil plug end
210	Fixing guard
223	Cable
226	Stator complete
240	Distance ring

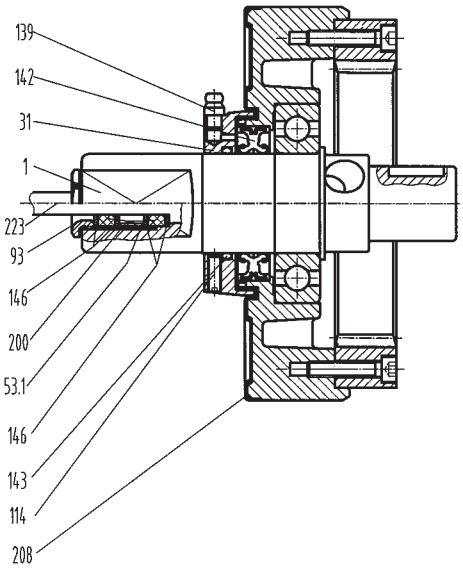
TS7N



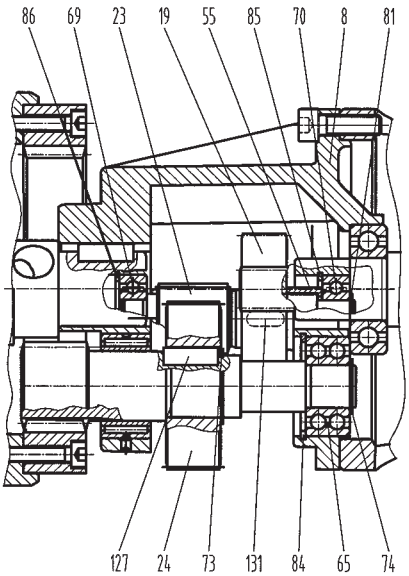
Elbow connector



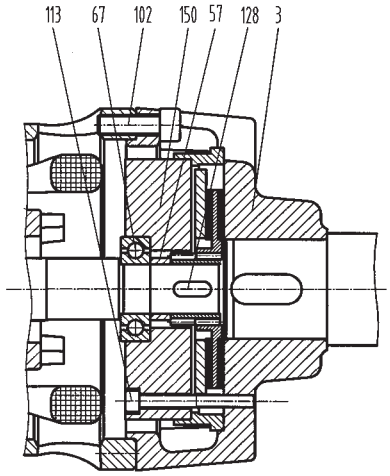
TS7N with cable connection



3-stage gearbox



Electromagnetic brake



Motorized Pulley 220M & 220H, Ø 8.50 in. (216 mm)

Our 8.50" diameter Motorized Pulley range offers two different performance levels for BULK applications:

- M for Medium duty
- H for Heavy duty

It is important to note the product differences and choose the appropriate pulley based on estimated belt tension (radial load.) See page 80. The actual radial load must be less than the maximum allowable radial load shown in this catalog.

Be aware of increased belt tensions required to drive multi-ply thick heavy belts and/or larger belt widths.

If the 8.50" diameter model is not strong enough to resist estimated belt tension, then select 12.64" diameter model.

M for Medium duty

The internal parts of 220M are designed to match irregular working conditions in applications such as mobile crushing & screening, cement & concrete plants, mobile conveyors and open stone & gravel pits.

H for Heavy duty

A reinforced 3-stage-gearbox provides 220H with the necessary strength needed for low speeds and high torque. 220H is popular in recycling (hand sorter conveyors), bunker discharge conveyors and where a combination of slow speed and high torque is required.

STANDARD SPECIFICATION of Motorized Pulley

- Crowned mild steel 8.50" diameter steel shell treated with anti-rust wax
- Powder coated cast iron bearing housings
- Mild steel shafts treated with anti-rust wax
- Shaft sealing system - degree of protection IP66/67 (EN60034-5.) See page 88.
- Powder coated die cast aluminum terminal box
- 3-phase induction motors with thermal protector
- Voltage: All common voltages available. Please specify.
- Motor winding insulation Class H
- Dynamically balanced rotor
- One out of two oil plugs fitted with a magnet to filter the oil
- Oil change recommended every 50,000 operational hours for synthetic oil (or 20,000 operational hours for mineral oil.)
- Minimum RL. Please refer to pages 21-22.
- Maximum RL — Please inquire
- Non standard RL's available
- To be used in horizontal positions ± 5 degree only

Please note:

- **Noise-sensitive Areas:** High speed 2-pole motors can cause higher noise levels and are not recommended for noise-sensitive areas
- **Technical Precautions for Design, Installation, and Maintenance:** pages 78-98.
- **Environmental Considerations:** page 76-77.
- **Optional Extras:** pg 19 and back cover
- **Electrical Connection Diagrams:** pages 92-98.

STAINLESS STEEL options

TS9N
- Stainless steel shell — AISI 304 range
- Stainless steel shafts — AISI 303/4 range
- Stainless steel covered bearing housings — AISI 316 range
- Stainless steel oil plugs — AISI 304 range — one out of two with magnet
- Stainless steel exterior bolts — AISI 304 range
- Regreasable labyrinth seals with grease nipples in stainless steel — AISI 304 range
- Shaft sealing system — degree of protection IP66/67 (EN60034-5). See page 37.

TS10N
- As TS9N, but without regreasable labyrinth seals.

SEMI-RUST-FREE options

TS11N
- As TS9N, but with crowned mild steel shell treated with anti-rust wax.

TS12N
- As TS10N, but with crowned mild steel shell treated with anti-rust wax.

Other Stainless Options:
- FDA & USDA food grade recognized oil and grease are not included in TS9N to TS12N, but available on request
- Complete Motorized Pulleys in acid resistant stainless steel — AISI 316 range — available on request.
- Special mounting brackets are available

Electrical connection options:
- Salt water resistant powder coated aluminum terminal box with zinc plated exterior bolts
- Stainless steel terminal box — AISI 304 range (max. 5.5 HP)
- Straight stainless steel connector with flying lead — AISI 304 range.

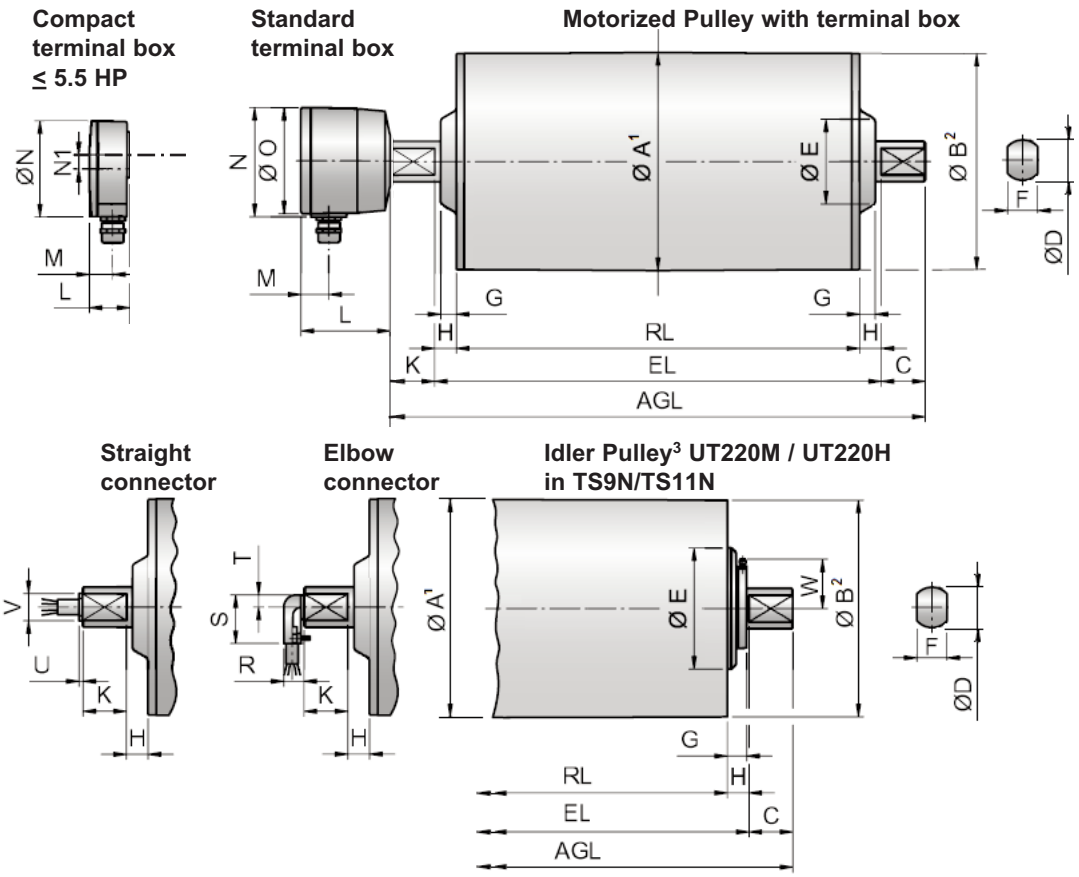
Please specify required TS-number when ordering Stainless Steel options.

OPTIONAL EXTRAS
Motorized Pulley 220M & 220H

Specification			Availability
Total stainless steel option AISI 304 range	TS9N	with regreasable labyrinth seals	x
Total stainless steel option AISI 304 range	TS10N	with standard seals	x
Semi-rust free option	TS11N	with regreasable labyrinth seals	x
Semi-rust free option	TS12N	with standard seals	x
Regreasable labyrinth seals			x
Food grade oil & grease - FDA & USDA recognized			x
Dust explosion proof Motorized Pulleys - ATEX 95 - Zone 22 - for applications handling of dusty grain etc. According to European Directive 94/9/EC.			o
Total acid resistant stainless steel option - AISI 316			x
Black rubber lagging - Standard specifications (See page 82-83.)			
1/4" smooth lagging - Hardness 60 ±5 Shore A			o
1/4" diamond lagging - Hardness 60 ±5 Shore A			o
White smooth rubber lagging (FDA). Oil, fat & grease resistant			o
Special lagging (e.g. hot vulcanized)			o
Electromagnetic brake		Min. RL increases by 3.94"	x
Mechanical backstop		Min. RL does not increase with backstop option	x
Modified for vertical mounting			o
Modified for mounting between 5° and 90° (e.g. for magnetic separators)			o
Insulation class F with standard oil: (Allowable ambient temperature -13°F/+104°F)			x
Insulation class H with synthetic oil: (Allowable ambient temperature -13°F/+120°F)			Std.
Special motors for applications with no belt contact			o
Low noise drives for noise sensitive areas			x
Parallel shell (i.e. no crown)			x
Thermal protector			Std.
IP66/67 Yellow powder coated aluminum terminal box			Std.
IP66/67 Gray powder coated aluminum terminal box (food grade approved)			x
IP66/67 Compact powder coated aluminum terminal box (food grade approved)		≤ 5.5 HP only	o
IP66/67 Compact stainless steel terminal box - AISI 304 or 316 range		≤ 5.5 HP only	o
Straight or elbow connector with standard power cord		≤ 5.5 HP only	x
Straight connector with screened power cord	(See page 86 for VFD precautions.)	≤ 5.5 HP only	x
Straight connector with power cord	(Stainless steel in AISI 304 range)	≤ 5.5 HP only	x
Voltage: single voltage (460) stator (Y winding) wired for 460v/3ph/60 Hz at terminal box			Std
single voltage (230) stator (Y winding) wired for 230v/3ph/60 Hz at terminal box			x
Special voltage motors			x
CSA approved motors			x

x = Optional extras
o = An option with certain limitations. Please refer to Technical precautions pages 78-98.
Std. = Fitted as standard

Motorized Pulley 220M & 220H, Ø 8.50 in. (216 mm)

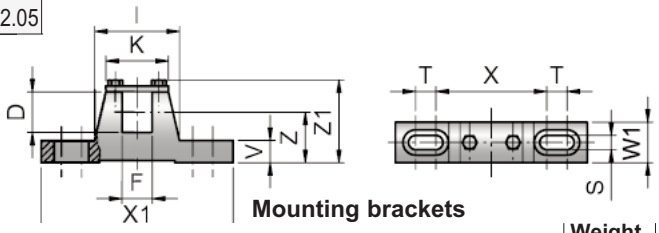


Model	Motorized Pulley or Idler Pulley A in	B in	C in	D in	E in	F in	G in	G TS9/11 in	H in	K in	W in	Standard terminal box L in	M in	N in	O in	Compact terminal box ≤ 5.5 HP L in	M in	N in	N1 in	Straight connector ≤ 5.5 HP U in	V in	Elbow connector ≤ 5.5 HP R in	S in	T in
220M & 220H	8.50	8.44	1.71	1.57	3.94	1.18	0.61	0.77	0.85	1.63	—	3.43	1.06	4.21	4.13	1.61	0.95	3.74	0.55	0.16	1.06	0.79	1.89	0.47
UT220M & UT220H	8.50	8.50	1.71	1.57	3.94	1.18	0.61	0.77	0.85	—	2.05													

1 A dimension is outer diameter of unlagged pulley shell at pulley centerline.

2 B dimension is outer diameter of unlagged pulley shell at each end of shell.

3 Idler pulley shown is non-crowned TS9N/TS11N version with regreasable seals.



Mounting brackets

Motorized Pulleys	Material	Bracket Size	Part Number	Dimensions												Weight
Model				D in	F in	I in	K in	S in	T in	V in	W1 in	X in	X1 in	Z in	Z1 in	lbs
220M & 220H	Steel painted	KL41-HD	6YA0K	1.57	1.18	3.31	2.44	0.55	0.79	0.87	1.57	4.33	7.48	1.97	3.27	4.63
	Steel Ni plated		6YA0W													
	Stainless steel		6YA0U													

Motorized Pulley 220M & 220H, Ø 8.50 in. (216 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5]									Type of Bracket
Power HP	No. of Poles								15.75	17.72	19.69	21.65	23.62	25.59	27.56	29.53	31.50	longer than 31.50	
0.50	8	3	220H	30 38	34 40	458 383	5620	17.72	-	146	154	160	168	175	182	189	196	See Foot-note[4]	KL41-HD 6YA0K
		2	220M	48 60 76 96 120 150 192 240 300	54 69 84 101 128 159 208 250 319	287 227 185 155 122 97 75 62 49	2585	15.75	111	117	125	132	139	146	154	160	168		
0.75	8	3	220H	30 38	34 40	685 577	5620	19.69	-	-	163	169	177	183	191	198	205		
		2	220M	48 60 76 96 120 150 192 240 300	54 69 84 101 128 159 208 250 319	430 337 277 231 181 146 112 93 73	2585	17.72	-	126	134	140	148	155	162	169	177		
1	8	3	220H	30 38	34 40	928 774	5620	19.69	-	-	163	169	177	183	191	198	205		
		2	220M	48 60 76 96 120 150 192 240 300	54 69 84 101 128 159 208 250 319	583 460 376 314 247 198 152 126 99	2585	17.72	-	126	134	140	148	155	162	169	177		
1.5	6	3	220H	38 48	46 54	1021 852	5620	19.69	-	-	156	163	170	177	184	191	199		
		2	220M	60 76	72 91	641 506	2585	17.72	-	122	129	136	144	150	158	165	172		
	4	2	220M	96 120 150 192 240 300 384 480 600	108 137 168 201 256 319 415 501 637	427 337 276 230 180 145 111 93 73	2585	15.75	106	113	121	127	135	141	149	156	163		
									← Special RL	Standard RL →								

Idler Pulley															
	Model UT220M	2585	15.75	60	65	70	74	80	84	90	94	99	See Foot-note[4]	KL41-HD 6YA0K
	Model UT220H	5620	15.75	64	69	74	79	84	89	94	98	104		

1 Use "nominal belt speed" to specify pulley. "Actual belt speed" is presented (for pulley lagged with 1/4" thick rubber) to assist with process design calculations. See Technical Precautions page 79. Note that "actual belt speed" decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding "Maximum radial load" defined above. See "Belt Tension" section in Technical Precautions, page 80.

4 Additional Motorized Pulley and Idler Pulley weight, specified per Roller Length:
31.50"≤ RL < 59.06" Wt = 3.7 lbs/in
59.06"≤ RL < 78.74" Wt = 7.1 lbs/in

5 All weights shown above are for pulleys with 1/4" thick lagging and do not include mounting brackets. To calculate unlagged pulley weight subtract 0.3 lbs/in of Roller Length from above.

Motorized Pulley 220M & 220H, Ø 8.50 in. (216 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5]									Type of Bracket
Power HP	No. of Poles								15.75	17.72	19.69	21.65	23.62	25.59	27.56	29.53	31.50	longer than 31.50	
2	6	3	220H	48 60	55 68	1137 928	5620	19.69	-	-	156	163	170	177	184	191	199	See Footnote[4]	KL41-HD 6YA0K
		2	220M	76	91	690	2585	17.72	-	126	134	140	148	155	162	169	177		
	4	2	220M	96 120 150 192 240 300 384 480 600	108 137 168 201 256 319 415 501 637	583 460 376 314 247 198 152 126 99	2585	15.75	110	117	125	132	139	146	154	160	164		
3	4	3	220H	60 76	68 82	1361 1136	5620	19.69	-	-	156	165	172	179	187	193	201		
		2	220M	96 120 150 192 240 300 384 480 600	108 137 168 201 256 319 415 501 637	855 675 551 460 361 291 223 185 145	2585	17.72	-	126	134	140	148	155	162	169	177		
4	4	3	220H	96 120	104 129	1216 978	5620	21.65	-	-	-	169	177	183	191	198	201		
		2	220M	150 192 240 300 384 480 600	168 201 256 319 415 501 637	751 627 492 396 304 252 197	2585	19.69	-	-	138	145	153	159	167	173	181		
5.5	2	3	220H	120 150	136 163	1237 1033	5620	21.65	-	-	-	169	177	183	191	198	205		
		2	220M	192 240 300 384 480 600	216 274 336 402 512 636	777 614 501 418 329 264	2585	19.69	-	-	138	145	153	159	167	173	181		
7.5	2	3	220H	192 240 300 384 480 600	202 254 314 408 522 625	1146 909 735 567 443 370	5620	21.65	-	-	-	169	177	183	191	198	205		

← Special RL | Standard RL →

Idler Pulley														
	Model UT220M	2585	15.75	59	65	70	74	80	84	90	94	99	See Footnote[4]	KL41-HD 6YA0K
	Model UT220H	5620	15.75	63	69	74	79	84	89	94	98	104		

1 Use "nominal belt speed" to specify pulley. "Actual belt speed" is presented (for pulley lagged with 1/4" thick rubber) to assist with process design calculations. See Technical Precautions page 79. Note that "actual belt speed" decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding "Maximum radial load" defined above. See "Belt Tension" section in Technical Precautions, page 80.

4 Additional Motorized Pulley and Idler Pulley weight, specified per Roller Length:
31.50"≤ RL < 59.06" Wt = 3.7 lbs/in
59.06"≤ RL < 78.74" Wt = 7.1 lbs/in

5 All weights shown above are for pulleys with 1/4" thick lagging and do not include mounting brackets. To calculate unlagged pulley weight subtract 0.3 lbs/in of Roller Length from above.

Motorized Pulley 220M, Ø 8.50 in. (216 mm)

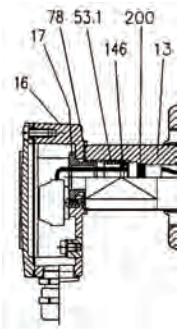
Spare parts list and sectional drawings

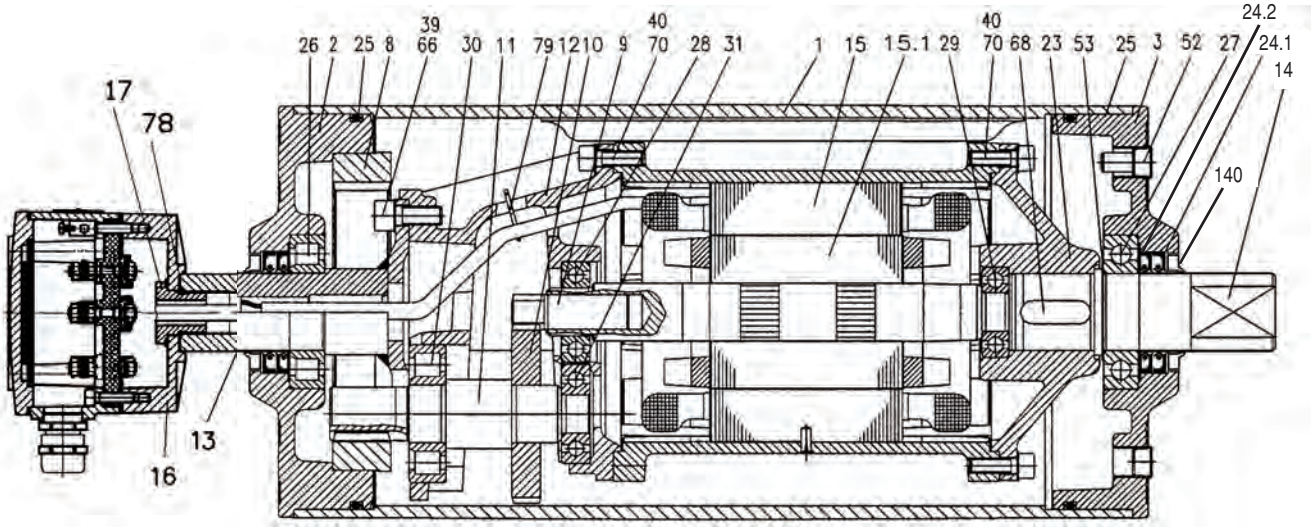
Pos.	Description
1	Shell
1.1	Shell (ss option)
2	End housing with geared rim
2.1	End hsg w/geared rim (ss option)
3	End housing
3.1	End housing (ss option)
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box
13	Front shaft
13.1	Front shaft (ss option)

Pos.	Description
14	Rear shaft
14.1	Rear shaft (ss option)
14.2	Rear shaft (short RL option)
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
20	Cover
20.1	Cover with labyrinth groove
23	Rear flange
23.1	rear flange for backstop
23.2	Rear flange for Brake
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal (lab option)
25	O-ring
26	Bearing
27	Bearing
28	Bearing
29	Bearing
29.1	Bearing (Backstop option)
30	Bearing
31	Bearing
39	Hexagon socket screw
40	Hexagon socket screw
41	Hexagon socket screw

Pos.	Description
52	Magnetic oil plug
52.1	Magntetic oil plug (ss option)
53	Distance washer
53.1	Compression nipple
59	Countersunk head screw
66	Waved spring washer
68	Key
70	Toothed washer
78	Gasket
79	Holding clip or plastic tie
85.1	Intermediate flange for brake
91	Electromagnetic brake
93	Retaining ring
95	Straight connector
96	Elbow connector
101	Key
104	Distance washer
120	Labyrinth cover
121	Set screw
122	O-ring
123	Grease nipple
124	Distance washer
140	Deflection seal
143	O-ring
146	Special compression washer
200	Rubber seal

Compact Terminal Box





Motorized Pulley 220H, Ø 8.50 in. (216 mm)

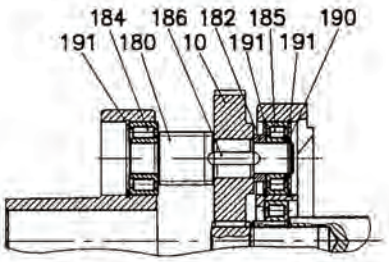
Spare parts list and sectional drawings

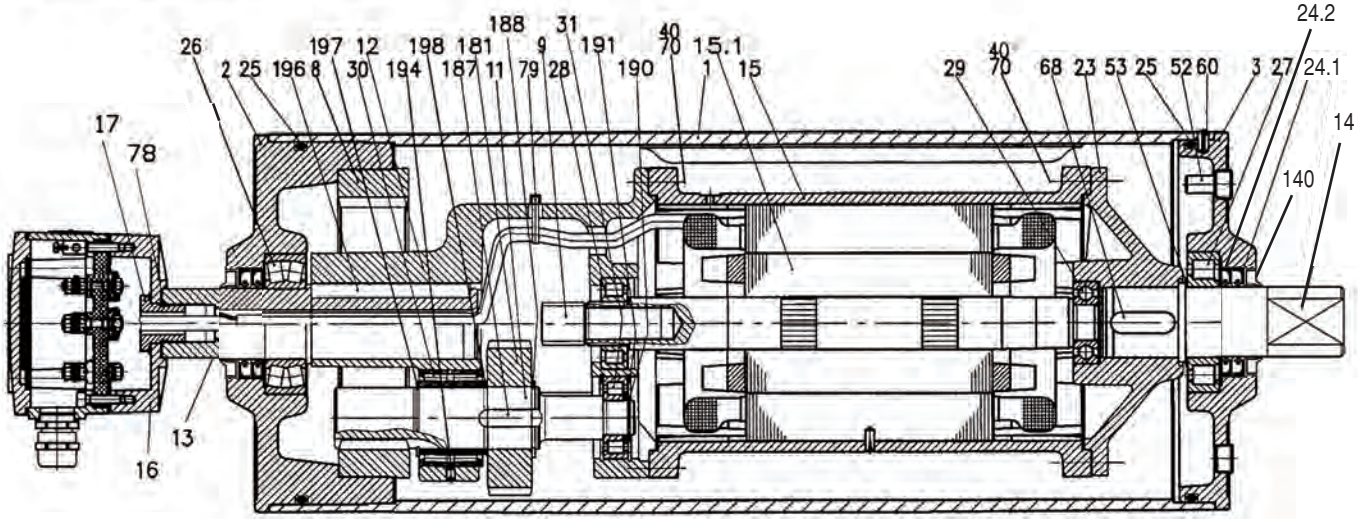
Pos.	Description
1	Shell
1.1	Shell (ss option)
2	End housing with geared rim
2.1	End hsg w/geared rim (ss option)
3	End housing
3.1	End housing (ss option)
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box
13	Front shaft
13.1	Front shaft (ss option)
14	Rear shaft
14.1	Rear shaft (ss option)
14.2	Rear shaft (short RL option)
15	Stator complete
15.1	Rotor

Pos.	Description
16	Terminal box complete
17	Nipple
20	Cover
20.1	Cover with labyrinth groove
23	Rear flange
23.1	Rear flange (backstop option)
23.2	Rear flange (int. brake option)
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal (lab option)
25	O-ring
26	Bearing
27	Bearing
28	Bearing
29	Bearing
29.1	Bearing (Backstop option)
30	Bearing
31	Bearing
40	Hexagon socket screw
41	Hexagon socket screw
52	Magnetic oil plug
52.1	Magntetic oil plug (ss option)
53	Distance washer
53.1	Compression nipple
59	Countersunk head screw
66	Waved spring washer
68	Key
70	Toothed washer
78	Gasket
79	Holding clip or plastic tie

Pos.	Description
85.1	Intermediate flange for brake
91	Electromagnetic brake
93	Retaining ring
95	Straight connector
96	Elbow connector
101	Key
104	Distance washer
120	Labyrinth cover
121	Set screw
122	O-ring
123	Grease nipple
124	Distance washer
140	Defection seal
143	O-ring
146	Special compression washer
180	Intermediate pinion
181	Intermediate wheel
182	Distance washer
184	Roller bearing
185	Roller bearing
186	Key
187	Key
188	Spring washer
190	Spring washer
191	Spring washer
194	Set screw
196	Key
197	Spring washer
198	Distance washer
200	Rubber seal

Intermediate Shaft

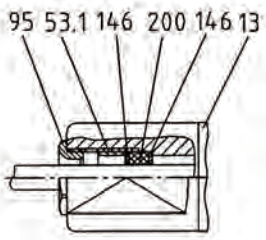




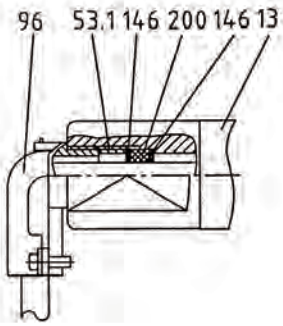
Motorized Pulley 220M & 220H, Ø 8.50 in. (216 mm)

Sectional drawings (See parts list on pages 23 & 24.)

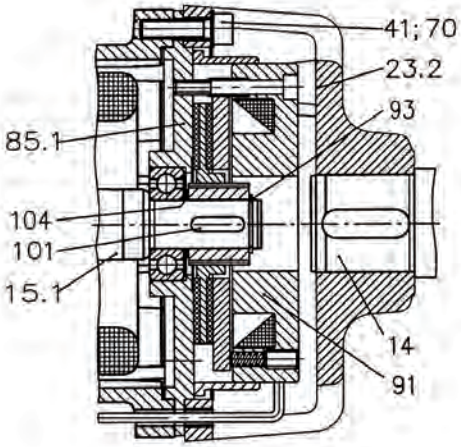
Straight Connector



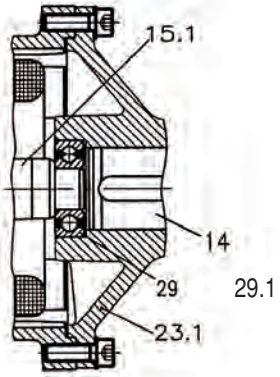
Elbow Connector



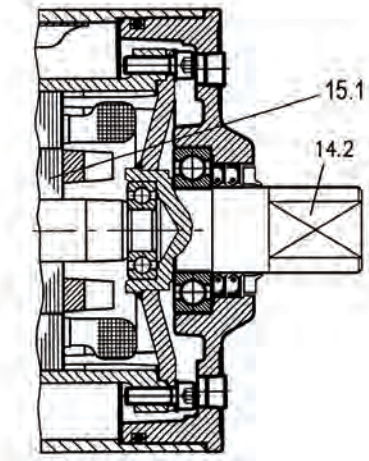
Electromagnetic Brake Option



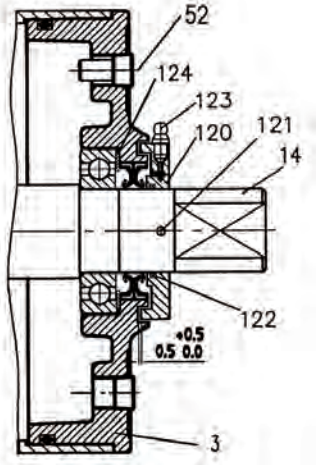
Mechanical Backstop Option



Short Roller Length Option



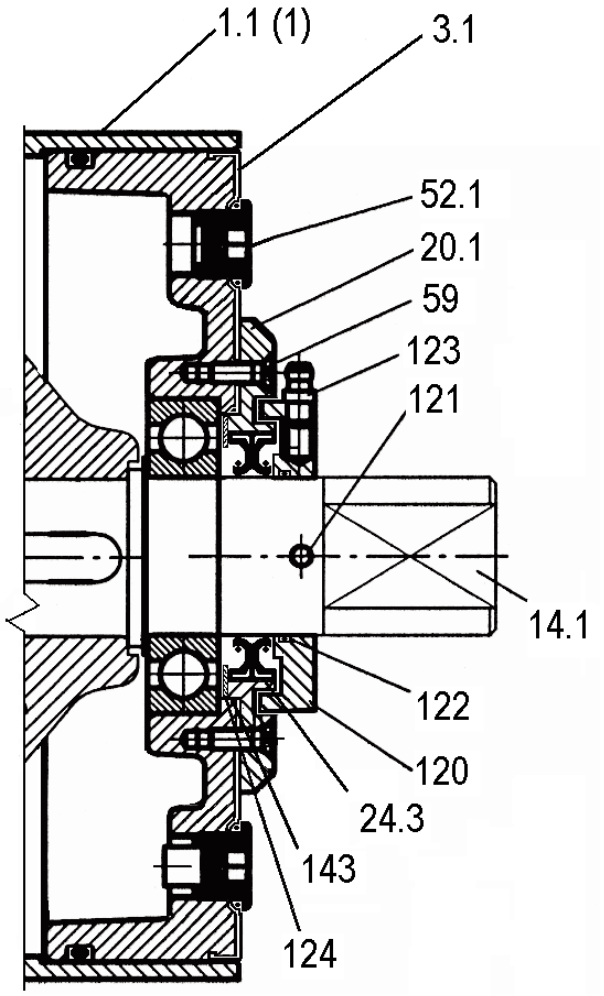
Carbon Steel Shell & Shaft with Labyrinth Option



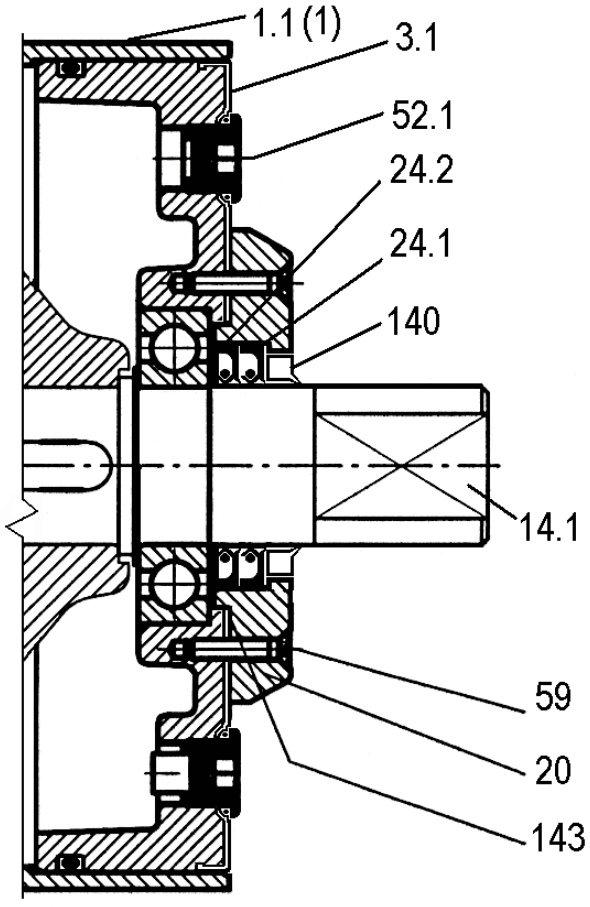
Motorized Pulley 220M & 220H, Ø 8.50 in. (216 mm)

Sectional drawings (See parts list on pages 23 & 24.)

Stainless Steel with Labyrinth Options TS9N
(Position 1 for carbon steel shell valid for TS11N only.)



Stainless Steel Non-Labyrinth Options TS10N
(Position 1 for carbon steel shell valid for TS12N only.)



ORDERING* INFORMATION
Motorized Pulleys

Contact Person _____ **Date** _____ **Ref #** _____
Company _____
Address _____
Phone _____ **Fax** _____ **Email** _____

Diameter (in)	Roller Length (in)	Belt Speed (fpm)
☐ 5.45	☐ 11.81	☐ 10
☐ 6.49	☐ 12.60	☐ 12
☐ 8.50	☐ 13.78	☐ 14
☐ 12.64	☐ 15.75	☐ 18
☐ 15.91	☐ 17.72	☐ 24
☐ 19.72	☐ 19.69	☐ 30
☐ 24.80	☐ 21.65	☐ 38
☐ 31.50	☐ 23.62	☐ 48
☐ 40.16	☐ 25.59	☐ 60
	☐ 27.56	☐ 76
	☐ 29.53	☐ 96
	☐ 31.50	☐ 120
	☐ 33.46	☐ 150
	☐ 35.43	☐ 192
	☐ 37.40	☐ 240
	☐ 39.37	☐ 300
	☐ 41.34	☐ 384
	☐ 43.31	☐ 480
	☐ 45.28	☐ 600
	☐ 47.24	☐ 768
	☐ 49.21	☐ 960
	☐ 51.18	☐ 1064
	☐ 53.15	☐ 1320
	☐ 55.12	
	☐ 57.09	
	☐ 59.06	
	☐ 61.02	
	☐ 62.99	
	☐ 64.96	
	☐ 66.93	
	☐ 68.90	
	☐ 70.87	
	☐ 72.83	
	☐ 74.80	
	☐ 76.77	
	☐ 78.74	
	☐ 80.71	
	☐ 82.68	
	☐ 84.65	
	☐ Other _____	

Power (HP)
☐ 0.13
☐ 0.15
☐ 0.25
☐ 0.33
☐ 0.50
☐ 0.75
☐ 1.0
☐ 1.5
☐ 2.0
☐ 3.0
☐ 4.0
☐ 5.5
☐ 7.5
☐ 10
☐ 15
☐ 20
☐ 25
☐ 30
☐ 40
☐ 50
☐ 61
☐ 75
☐ 100
☐ 122
☐ 150
☐ 180
☐ 220
☐ 270
☐ 330

Voltage
☐ 208v
☐ 230v
☐ 380v
☐ 460v
☐ 575v

Phase & Frequency
☐ 3ph/60Hz
☐ 3ph/50Hz
☐ 1ph/60Hz
☐ 1ph/50Hz

Lagging Material
☐ black rubber, diamond pattern
☐ black rubber, smooth pattern
☐ white rubber, smooth pattern
☐ solid ceramic bonded to pulley shell
☐ ceramic plates vulc. into rubber

Lagging Bond
☐ cold bonded
☐ hot vulcanized

Lagging Thickness
☐ 1/8 inch
☐ 1/4 inch
☐ 5/16 inch
☐ 3/8 inch
☐ 1/2 inch

Termination (select one)
☐ standard box, standard paint
☐ standard box, food grade paint
☐ standard box, unpainted
☐ compact box, unpainted
☐ compact box. stainless steel
☐ power cord, elbow connector
☐ power cord, stan. straight connector
☐ power cord, SS straight connector

Power Cord (if applicable)
☐ 4 ft, standard insulation
☐ 4 ft, screened
☐ 10 ft, standard insulation
☐ 10 ft, screened

Type of Oil
☐ standard
☐ synthetic
☐ food grade

Motor Insulation
☐ class F (standard)
☐ class H

Type of Crown
☐ center crown
☐ trapezoidal crown
☐ no crown

Mounting Brackets
☐ standard paint
☐ nickel plated
☐ none

Type of Holdback
☐ mech. backstop, clockwise
☐ mech. backstop, counterclockwise
☐ internal brake
☐ external brake shaft

Type of Seals
☐ standard
☐ regreasable

Material & Surface Finish
☐ mild steel, standard paint
☐ total stainless steel
☐ semi-rust free

Other Special Options
☐ vertical shaft (see page 91)
☐ inclined shaft (see page 91)
☐ CSA approved motor
☐ dust explosion proof (per ATEX 95, Zone 22)

Quantity _____ **Motorized Pulley(s)**
Special Comments: _____
_____
_____

* Note that this form displays all powers, speeds, and options available from Rulmeca. Some combinations are unavailable (e.g. 100 HP is not available in 12.64î diameter.) For interactive ordering sheet go to www.rulmecacorp.com.

Motorized Pulley 320L, 320M & 320H, Ø 12.64 in. (321 mm)

Our 12.64" diameter Motorized Pulley range offers three different performance levels for BULK applications:

- L for Light duty
- M for Medium duty
- H for Heavy duty

It is important to note the product differences and choose the appropriate pulley based on estimated belt tension (radial load.) See page 80. The actual radial load must be less than the maximum allowable radial load shown in this catalog.

Be aware of increased belt tensions required to drive multi-ply thick heavy belts and/or larger belt widths.

If the 12.64" diameter model is not strong enough to resist estimated belt tension, then select 15.91" diameter model.

L for Light duty

320L is designed for regular and continuous operating conditions. It is advisable to rubber lag these pulleys to grip the belt and limit belt tension. Typical applications are portable conveyors and cross belts in mobile crushing and screening equipment. 320L should not be used for low speed high torque feeder conveyors. 320L uses motor and gearbox from 220M.

M for Medium duty

The internal parts of 320M are designed for tough and irregular operating conditions (e.g. crushing & screening applications, asphalt, cement, and concrete plants.)

H for Heavy duty

A solid 3-stage gearbox, larger shafts, and stronger bearings enable the 320H to provide low speed at high torque and handle irregular loadings in harsh operating conditions.

STANDARD SPECIFICATION of Motorized Pulley

- Crowned mild steel 12.64" diameter steel shell treated with anti-rust wax
- Powder coated cast iron bearing housings
- Mild steel shafts treated with anti-rust wax
- Shaft sealing system — degree of protection IP66/67 (EN60034-5.) See page 37.
- Powder coated die cast aluminum terminal box
- 3-phase induction motors with thermal protector
- Voltage: All common voltages available. Please specify.
- Motor winding insulation Class H
- Dynamically balanced rotor
- One out of two oil plugs fitted with a magnet to filter the oil in 320L
- Two oil plugs fitted with a magnet to filter the oil in 320M & 320H
- Oil change recommended every 50,000 operational hours for synthetic oil. (or 20,000 operational hours for mineral oil)
- Minimum RL. Please refer to pages 31-32.
- Maximum RL — Please inquire.
- Non standard RL's available
- To be used in horizontal positions ± 5 degree only

Please note:

- **Noise-sensitive Areas:** High speed 2-pole motors can cause higher noise levels and are not recommended for noise-sensitive areas
- **Technical Precautions for Design, Installation, and Maintenance:** pages 78-98.
- **Environmental Considerations:** page 76-77.
- **Optional Extras:** page 29 and back cover
- **Electrical Connection Diagrams:** pages 92-98.

STAINLESS STEEL options

TS9N
- Stainless steel shell — AISI 304 range
- Stainless steel shafts — AISI 303/4 range
- Stainless steel covered bearing housings — AISI 316 range
- Stainless steel oil plugs — AISI 304 range — one out of two with magnet
- Stainless steel exterior bolts — AISI 304 range
- Regreasable labyrinth seals with grease nipples in stainless steel — AISI 304 range
- Shaft sealing system — degree of protection IP66/67 (EN60034-5). Page 37.

TS10N
- As TS9N, but without regreasable labyrinth seals.

SEMI-RUST-FREE options

TS11N
- As TS9N, but with crowned mild steel shell treated with anti-rust wax.

TS12N
- As TS10N, but with crowned mild steel shell treated with anti-rust wax.

Other Stainless Options:

- FDA & USDA food grade recognized oil and grease are not included in TS9N to TS12N, but available on request
- Complete Motorized Pulleys in acid resistant stainless steel — AISI 316 range — available on request.
- Special mounting brackets are available.

Electrical connection options:

- Salt water resistant powder coated aluminum terminal box with zinc plated exterior bolts
- Stainless steel terminal box — AISI 304 range (max. 5.5 HP)
- Straight stainless steel connector with flying lead — AISI 304 range.

Please specify required TS-number when ordering Stainless Steel options.

OPTIONAL EXTRAS
Motorized Pulley 320L, 320M & 320H

Specification			Availability
Total stainless steel option AISI 304 range	TS9N	with regreasable labyrinth seals	x
Total stainless steel option AISI 304 range	TS10N	with standard seals	x
Semi-rust free option	TS11N	with regreasable labyrinth seals	x
Semi-rust free option	TS12N	with standard seals	x
Regreasable labyrinth seals			x
Food grade oil & grease - FDA & USDA recognized			x
Dust explosion proof Motorized Pulleys - ATEX 95 - Zone 22 - for applications handling of dusty grain etc. According to European Directive 94/9/EC.			o
Total acid resistant stainless steel option - AISI 316			x
Black rubber lagging - Standard specifications (See page 82-83.)			
5/16" diamond lagging - Hardness 60 ±5 Shore A		≤ 7.5 HP	x
1/4" diamond lagging - Hardness 60 ±5 Shore A		10 HP	o
White smooth rubber lagging (FDA listed) Oil, fat & grease resistant			o
Special lagging (e.g. hot vulcanized)			o
Electromagnetic brake	Min RL increases by 3.94"		x
Mechanical backstop	Min RL does not increase for 320L,		x
	Min. RL increases by 1.97" for 320 M & 320H		x
Modified for vertical mounting			o
Modified for mounting between 5° and 90° (e.g. for magnetic separators)			o
Insulation class F with standard oil: (Allowable ambient temperature -13°F/+104°F)			x
Insulation class H with synthetic oil: (Allowable ambient temperature -13°F/+120°F)			Std.
Special motors for applications with no belt contact			o
Low noise drives for noise sensitive areas			x
Parallel shell (i.e. no crown)			x
Thermal protector			Std.
IP66/67 Yellow powder coated aluminum terminal box			Std.
IP66/67 Gray powder coated aluminum terminal box (food grade approved)			x
IP66/67 Compact powder coated aluminum terminal box (food grade approved)		≤ 5.5 HP only	o
IP66/67 Compact stainless steel terminal box - AISI 304 or 316 range		≤ 5.5 HP only	o
Straight or elbow connector with standard power cord		≤ 5.5 HP only	x
Straight connector with screened power cord	(See page 86 for VFD precautions)	≤ 5.5 HP only	x
Straight connector with power cord	(Stainless steel in AISI 304 range)	≤ 5.5 HP only	x
Voltage: single voltage (460) stator (Y winding) wired for 460v/3ph/60 Hz at terminal box			Std
single voltage (230) stator (Y winding) wired for 230v/3ph/60 Hz at terminal box			x
Special voltage motors			x
CSA approved motors			x

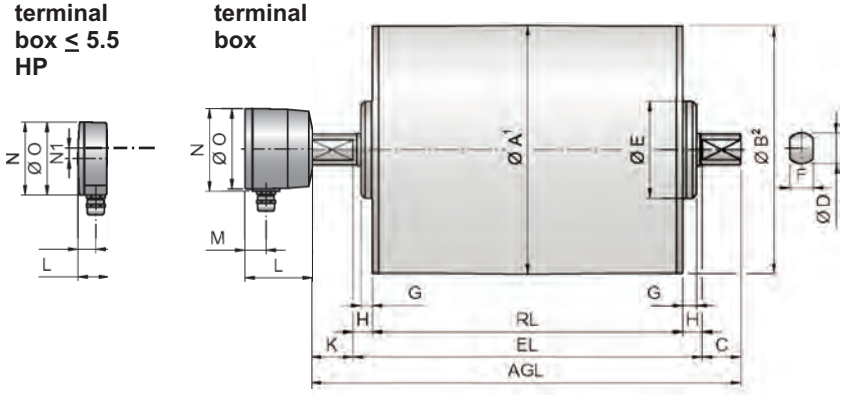
x = Optional extras
o = An option with certain limitations. Please refer to Technical precautions pages 78-98!
Std. = Fitted as standard

Motorized Pulley 320L, 320M & 320H, Ø 12.64 in. (321 mm)

Compact terminal box ≤ 5.5 HP

Standard terminal box

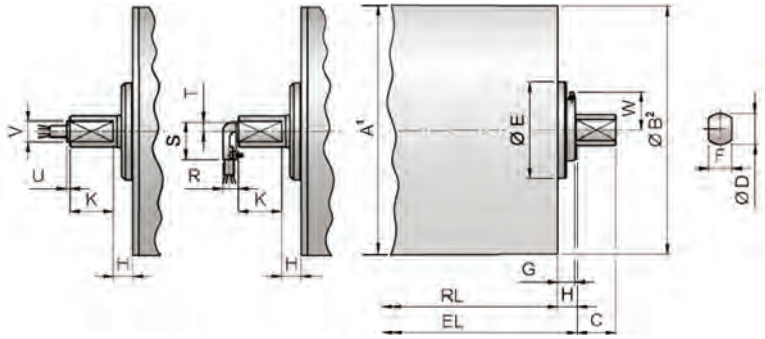
Motorized Pulley with terminal box



Straight connector

Elbow connector

Idler Pulley[3] UT320M / UT320H in TS9N/TS11N

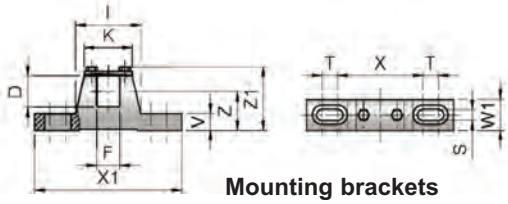


Model	Motorized Pulley or idler Pulley A in	B in	C in	D in	E in	F in	G in	G TS9/11 in	H in	K in	W in	Standard terminal box L in	M in	N in	O in	Compact terminal box ≤ 5.5 HP L in	M in	N in	N1 in	Straight connector ≤ 5.5 HP U in	V in	Elbow connector ≤ 5.5 HP R in	S in	T in
320L	12.72	12.56	1.97	1.57	3.78	1.18	0.59	0.75	0.98	2.13	—	—	—	—	—	1.61	0.95	3.74	0.55	0.16	1.06	0.79	1.89	0.47
320M	12.64	12.56	1.97	1.57	4.92	1.18	0.69	0.89	0.98	2.13	—	3.43	1.06	4.21	4.13	1.61	0.95	3.74	0.55	0.16	1.06	0.79	1.89	0.47
320H	12.64	12.56	1.97	1.97	5.83	1.57	0.43	0.81	0.98	2.17	—	3.43	1.06	4.21	4.13	1.61	0.95	3.74	0.55	0.16	1.06	0.79	1.89	0.47
UT320M	12.64	12.64	1.97	1.57	4.92	1.18	0.57	0.89	0.98	—	2.05													
UT320H	12.64	12.64	1.97	1.97	5.83	1.57	0.43	0.81	0.98	—	2.05													

1 A dimension is outer diameter of unlagged pulley shell at pulley centerline.

2 B dimension is outer diameter of unlagged pulley shell at each end of shell.

3 Idler pulley shown is non-crowned TS9N/TS11N version with regreasable seals.



Mounting brackets

Motorized Pulleys Model	Material	Bracket Size	Part Number	Dimensions D	F	I	K	S	T	V	W1	X	X1	Z	Z1	Weight lbs
320L & 320M	Steel painted	KL41-HD	6YA0K	1.57	1.18	3.31	2.44	0.55	0.79	0.87	1.57	4.33	7.48	1.97	3.27	4.63
	Steel Ni plated		6YA0W													
	Stainless steel		6YA0U													
320H	Steel painted	KL42	6YA0J	1.97	1.57	4.76	3.54	0.71	1.18	0.98	1.97	5.91	9.84	2.76	4.33	9.92
	Steel Ni plated		6YA0S													

Motorized Pulley 320L, Ø 12.64 in. (321 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5]									Type of Bracket
Power HP	No. of Poles								15.75	17.72	19.69	21.65	23.62	25.59	27.56	29.53	31.50	longer than 31.50"	
1	8	2	320L	76 96 120 150 192 240 300	78 100 122 146 186 231 300	402 317 259 216 170 137 105	2585	17.72	-	180	190	200	209	219	223	239	249	See Footnote[4]	KL41-HD 6YA0K
1.5	6	2	320L	120	132	349	2585	17.72	-	185	194	204	214	224	234	243	253		
	4	2	320L	150 192 240 300 384 480 600	157 199 243 292 371 462 602	294 233 190 159 124 100 77	2585	15.75	168	176	185	195	205	215	225	234	244		
2	6	2	320L	120	132	476	2585	17.72	-	189	199	209	218	228	238	248	258		
	4	2	320L	150 192 240 300 384 480 600	157 199 243 292 371 462 602	402 317 259 216 170 137 105	2585	15.75	172	180	190	200	209	219	229	239	249		
3	4	2	320L	150 192 240 300 384 480 600	157 199 243 292 371 462 602	590 466 380 317 249 200 154	2585	17.72	-	189	199	208	218	228	238	248	258		
4	4	2	320L	240 300 384 480 600	243 292 371 462 602	518 433 340 273 210	2585	19.69	-	-	207	217	227	237	247	257	266		
5.5	2	2	320L	300 384 480 600	314 397 487 583	536 423 345 289	2585	19.69	-	-	207	217	227	237	247	257	266		
								← Special RL			Standard RL →								

Motorized Pulley 320M & 320H, Ø 12.64 in. (321 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Special min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5]									Type of Bracket
Power HP	No. of Poles								17.72	19.69	21.65	23.62	25.59	27.56	29.53	31.50	33.46	longer than 33.46	
1	12	3	320H	24 30	25 32	1241 984	7868	21.65	-	-	308	317	329	341	354	366	378	See Footnote[4]	KL42 6YA0J
		2	320M	38 48 60 76 96 120 150 192	41 54 69 83 108 135 166 212	774 581 461 377 291 233 190 148	4496	19.69	-	251	261	271	281	291	301	310	320		KL41-HD 6YA0K
1.5	12	3	320H	24 30	25 32	1821 1444	7868	21.65	-	-	308	317	329	341	354	366	378		KL42 6YA0J
		2	320M	38 48	41 54	1128 851	4496	19.69	-	251	261	271	281	291	301	310	320		KL41-HD 6YA0K
	8	2	320M	60 76 96 120 150 192 240 300	61 81 103 126 162 203 249 319	752 568 450 368 285 228 186 145													
								← Special RL			Standard RL →								

Idler Pulley														
	Model UT320M	4496	17.72	118	128	138	148	158	167	177	187	197	See Footnote[4]	KL41-HD 6YA0K
	Model UT320H	7868	17.72	131	143	153	163	173	183	193	202	212		KL42 6YA0J

Refer to page 32 for all footnotes cited on page 31.

Motorized Pulley 320M & 320H, Ø 12.64 in. (321 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5]									Type of Bracket
Power HP	No. of Poles								17.72	19.69	21.65	23.62	25.59	27.56	29.53	31.50	33.46	longer than 33.46"	
2	8	3	320H	38 48	39 49	1574 1253	7868	21.65	-	-	308	317	329	341	354	366	378		KL42 6YA0J
		2	320M	60 76 96 120 150 192 240 300	68 84 104 127 164 205 251 322	903 731 590 483 374 299 245 191	4496	19.69	-	252	261	271	281	291	301	310	320		KL41-HD 6YA0K
3	8	3	320H	38 48	39 49	2361 1879	7868	21.65	-	-	308	317	329	341	354	369	378		KL42
		2	320M	60 76 96	68 84 104	1354 1096 885	4496	19.69	-	252	261	271	281	291	301	310	320		KL41-HD 6YA0K
	4	2	320M	120 150 192 240 300 384 480 600	136 168 207 253 328 410 502 643	677 548 445 364 281 225 183 143	4496	19.69	-	229	239	249	258	268	278	288	298		KL41-HD 6YA0K
4	6	3	320H	48 60 76	52 65 79	2361 1889 1554	7868	21.65	-	-	308	317	329	341	354	366	378		KL42 6YA0J
		2	320M	96	91	1349													
	4	2	320M	120 150 192 240 300 384 480 600	136 168 207 253 328 410 502 643	903 731 593 485 374 299 245 191	4496	19.69	-	229	239	249	258	268	278	288	298	See Foot-note[4]	KL41-HD 6YA0K
5.5	6	3	320H	76 96 120	79 102 128	2137 1655 1319	7868	21.65	-	-	308	317	329	341	354	366	378		KL42 6YA0J
	4	2	320M	150 192 240 300 384 480 600	168 207 253 328 410 502 643	1005 815 667 515 412 336 263	4496	19.69	-	252	261	271	281	291	301	310	320		KL41-HD 6YA0K
7.5	4	3	320H	96 120 150	97 118 153	2373 1951 1504	7868	21.65	-	-	308	317	329	341	354	366	378		KL42 6YA0J
		2	320M	192 240 300 384 480 600	207 253 328 410 502 643	1112 910 702 561 459 358	4496	19.69	-	252	261	271	281	291	301	310	320		KL41-HD 6YA0K
10	2	3	320H	150 192 240	157 194 237	1955 1582 1295	7868	21.65	-	-	308	317	329	341	354	366	378		KL42 6YA0J
		2	320M	300 384 480 600	335 415 506 655	916 740 607 469	4496	19.69	-	252	261	271	281	291	301	310	320		KL41-HD 6YA0K
								← Special RL			Standard RL →								
15	2	3	320H	240 300 384 480	237 307 384 470	1942 1500 1199 979	7868	43.31	-	-	-	-	-	-	-	-	-		KL42 6YA0J
		2	320M	600	655	703	4496	43.31	-	-	-	-	-	-	-	-	-		KL41-HD

1 Use "nominal belt speed" to specify pulley. "Actual belt speed" is presented (for pulley lagged with 5/16" thick rubber) to assist with process design calculations. See Technical Precautions page 79. Note that "actual belt speed" decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding "Maximum radial load" defined above. See "Belt Tension" section in Technical Precautions, page 80.

4 Additional Motorized Pulley and Idler Pulley weight, specified per Roller Length: 31.50"≤ RL < 62.99" Wt = 6.1 lbs/in; 62.99"≤ RL ≤ 78.74" Wt = 11.7

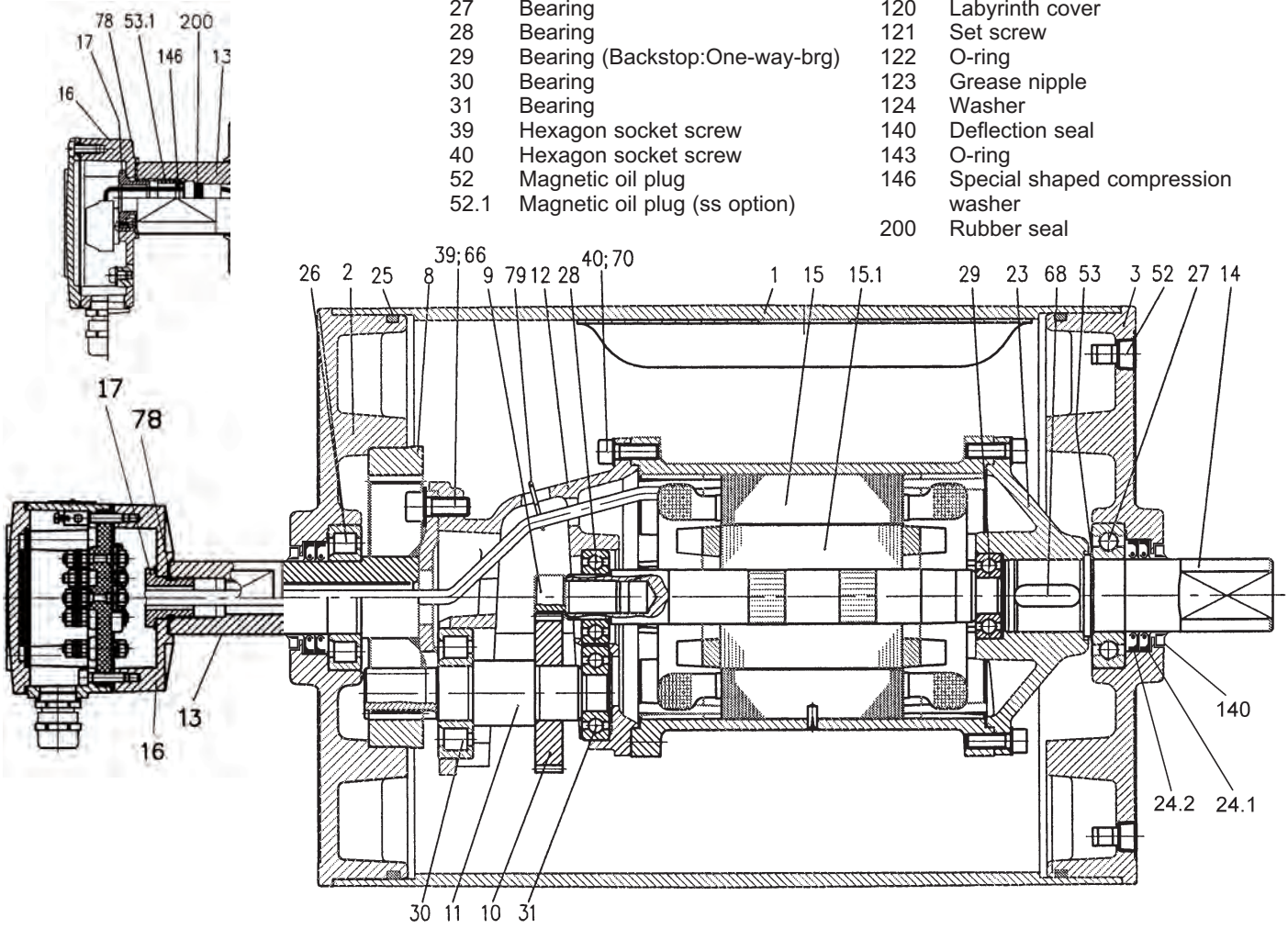
5 Weights above are for pulleys with 5/16" lagging and do not include mounting brackets. To calculate unlagged pulley wt. subtract 0.5 lbs/in of RL from above.

Motorized Pulley 320L, Ø 12.64 in. (321 mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
1.1	Shell (ss option)
2	End housing with geared rim
2.1	End hsg w/geared rim (ss option)
3	End housing
3.1	End hosuing (ss option)
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box
13	Front shaft
13.1	Front shaft (ss option)
14	Rear shaft
14.1	Rear shaft (ss option)
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
20	Cover
20.1	Cover with labyrinth groove
23	Rear flange
23.1	Rear flange for backstop
23.2	Rear flange for brake
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.5	Shaft oil seal (labyrinth option)
25	O-ring
26	Bearing
27	Bearing
28	Bearing
29	Bearing (Backstop:One-way-brg)
30	Bearing
31	Bearing
39	Hexagon socket screw
40	Hexagon socket screw
52	Magnetic oil plug
52.1	Magnetic oil plug (ss option)
53	Distance washer
53.1	Compression nipple
59	Countersunk head screw
66	Waved spring washer
68	Key
70	Toothed washer
78	Gasket
79	Holding clip or plastic tie
85	Intermediate flange for backstop
85.1	Intermediate flange for brake
91	Electromagnetic brake
93	Retaining ring
95	Straight connector
96	Elbow connector
101	Key
104	Distance washer
120	Labyrinth cover
121	Set screw
122	O-ring
123	Grease nipple
124	Washer
140	Deflection seal
143	O-ring
146	Special shaped compression washer
200	Rubber seal

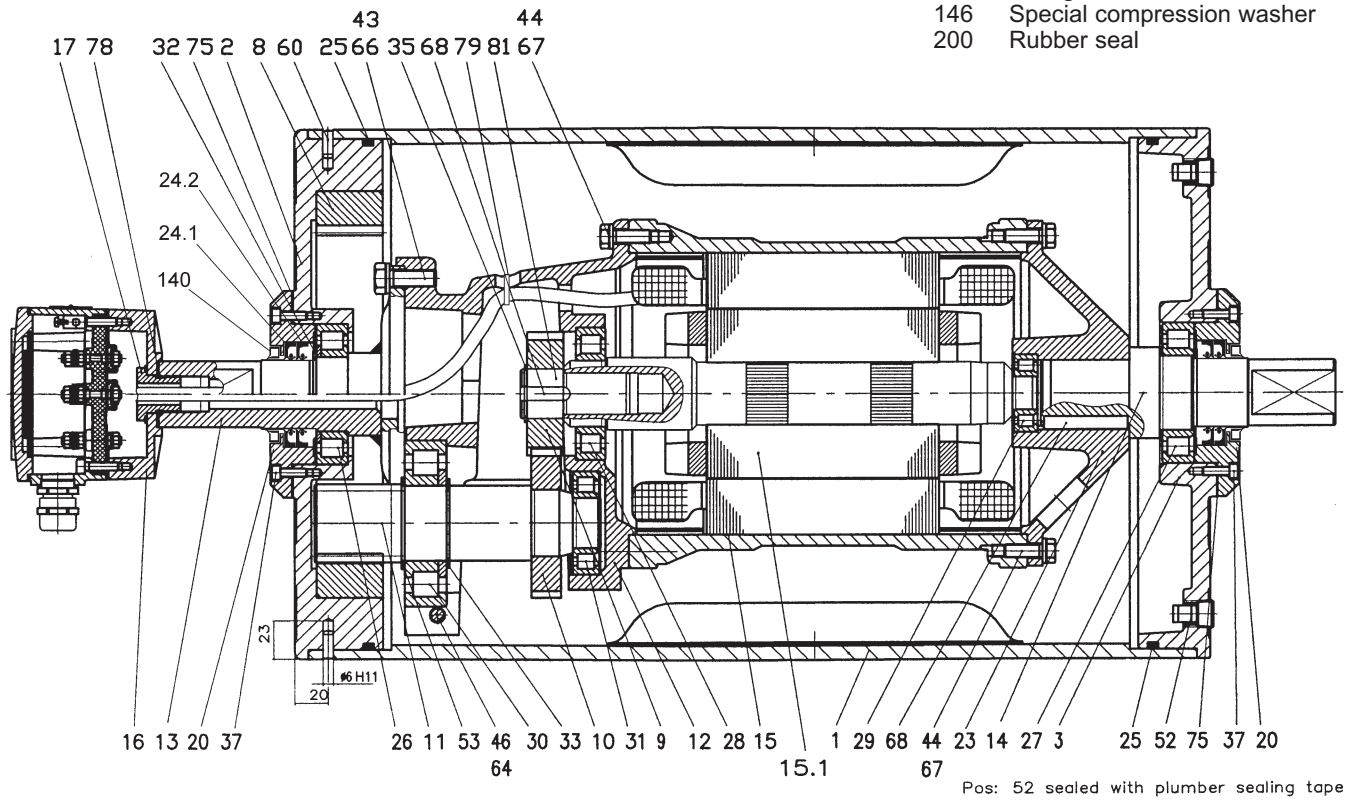
Compact Terminal Box



Motorized Pulley 320M, Ø 12.64 in. (321 mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
1.1	Shell (ss option)
2	End housing with geared rim
2.1	End hsg w/geared rim (ss option)
3	End housing
3.1	End housing (ss option)
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box
13	Front shaft
13.1	Front shaft (ss option)
14	Rear shaft
14.1	Rear shaft (ss option)
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
20	Cover
20.1	Cover with labyrinth groove
23	Rear flange
23.1	Rear flange for backstop/Brake
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal outer (lab. option)
24.4	Shaft oil seal inner (lab. option)
25	O-ring
26	Bearing
27	Bearing
28	Bearing
29	Bearing
30	Bearing
31	Bearing
32	Retaining ring
33	Retaining ring
35	Retaining ring
37	Hexagon socket screw
43	Hexagon socket screw
44	Hexagon socket screw
45	Hexagon head screw
46	Hexagon head screw
49	Washer
52	Magnetic oil plug
52.1	Magnetic oil plug (ss option)
53	Distance washer
53.1	Compression nipple
60	Parallel pin
64	Prevailing torque type hex.nut
66	Waved spring washer
67	Waved spring washer
68	Key
70	Waved spring washer
75	Gasket
78	Gasket
79	Holding clip or plastic tie
85	Intermediate flange for backstop
85.1	Intermediate flange for brake assy
90	Backstop
91	Electromagnetic brake
93	Retaining ring
94	Hexagon head screw
95	Straight connector
96	Elbow connector
99	Waved spring washer
101	Key
104	Distance washer
120	Labyrinth cover
121	Set screw
122	O-ring
123	Grease nipple
140	Deflection seal
143	O-ring
146	Special compression washer
200	Rubber seal



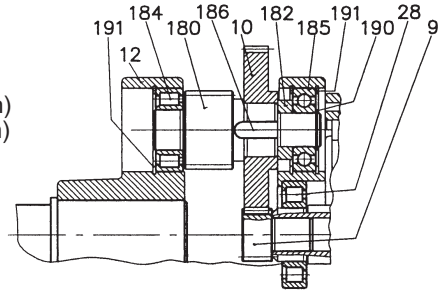
Motorized Pulley 320H, Ø 12.64 in. (321 mm)

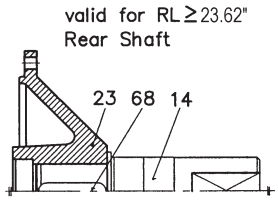
Spare parts list and sectional drawings

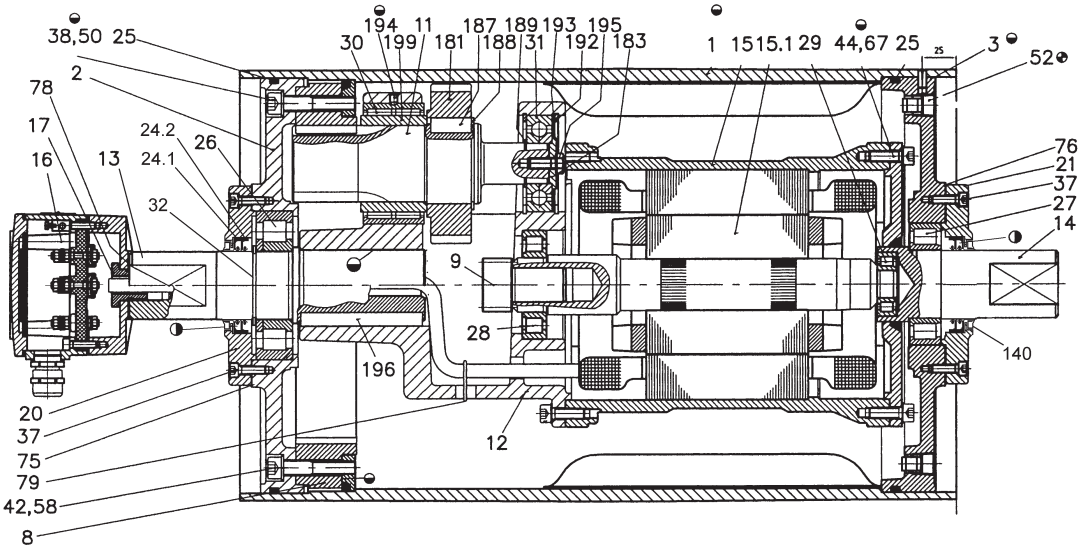
Pos.	Description
1	Shell
1.1	Shell (ss option)
2	End housing with geared rim
2.1	End hsg w/geared rim (ss option)
3	End housing
3.1	End housing (ss option)
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box
13	Front shaft
13.1	Front shaft (ss option)
14	Rear shaft
14.1	Rear shaft (ss option)
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
20	Cover front side
20.1	Cover with labyrinth groove
21	Cover — rear side
21.1	Cover with labyrinth groove
23	Rear flange
23.1	Rear flange for brake option
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal outer (lab. option)
24.4	Shaft oil seal inner (lab. option)
25	O-ring
26	Bearing
27	Bearing
28	Bearing
29	Bearing
30	Bearing
31	Bearing
32	Retaining ring
33	Retaining ring
35	Retaining ring
37	Hexagon socket screw
38	Hexagon socket screw
43	Hexagon head screw
44	Hexagon head screw
45	Hexagon head screw
46	Hexagon head screw
49	Washer
50	Washer
52	Magnetic oil plug
52.1	Magnetic oil plug (ss option)
53	Distance washer
53.1	Compression nipple
60	Parallel pin
64	Hexagon head nut
66	Waved spring washer
67	Waved spring washer
68	Key

Pos.	Description
70	Waved spring washer
73	Set screw
75	Gasket
78	Gasket
79	Holding clip or plastic tie
80	Hexagon head screw
84	Rear flange for brake
85	Intermediate flange for backstop
85.1	Intermediate flange for brake assembly
90	Backstop
91	Electromagnetic brake
93	Retaining ring
94	Hexagon head screw
95	Straight connector
96	Elbow connector
99	Waved spring washer
101	Key
104	Distance washer
120	Labyrinth cover
121	Set screw
122	O-ring

Pos.	Description
123	Grease nipple
143	O-ring
146	Special shaped compression washer
180	Intermediate pinion shaft
181	Intermediate pinion
182	Distance bushing
183	Washer
184	Roller bearing
185	Roller bearing
186	Key
187	Key
188	Retaining ring
190	Retaining ring
191	Retaining ring
192	Retaining ring
193	Distance washer
194	Set screw
195	Prevailing torque type hexagon nut
196	Key
197	Retaining ring
198	Distance ring
200	Rubber seal



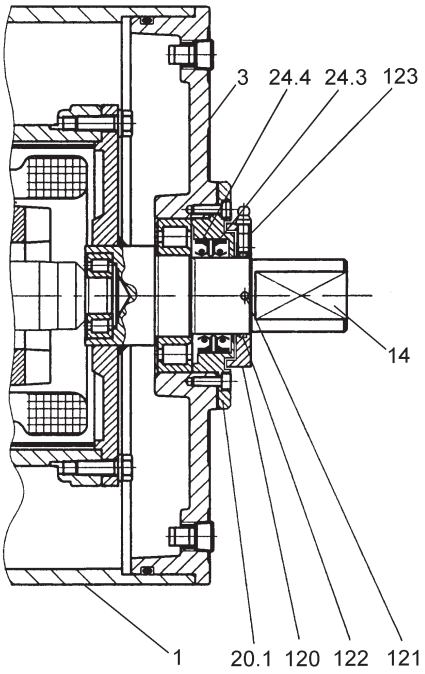




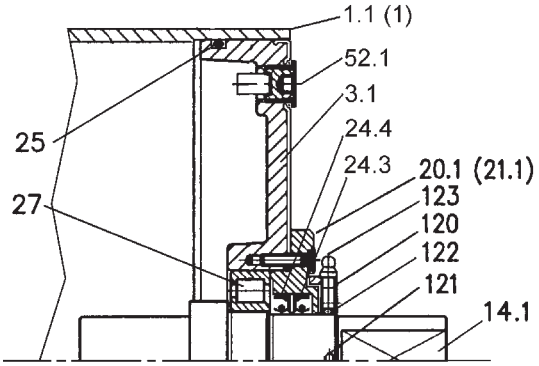
Motorized Pulley 320L, 320M & 320H, Ø 12.64 in. (321 mm)

Sectional drawings

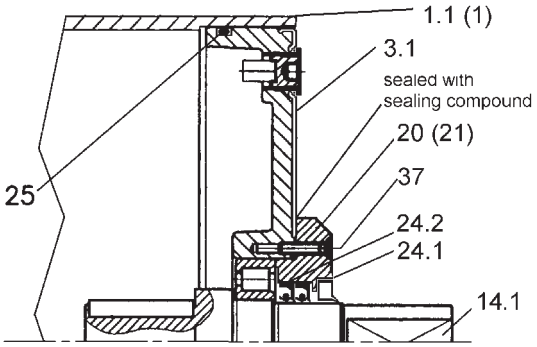
Carbon Steel Shell & Shaft
with Labyrinth Option



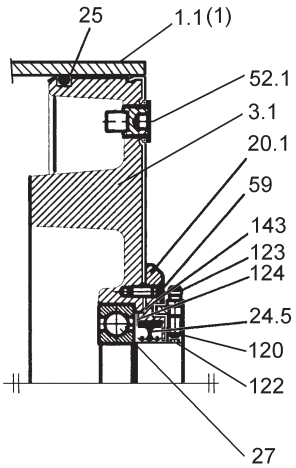
320M & 320H Stainless Steel with Labyrinth Options TS9N
(Position 1 for carbon steel shell valid for TS11N only)
(Position 21.1 valid for 320H only)



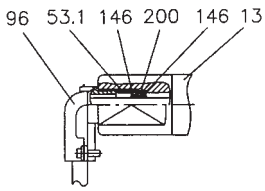
320M & 320H Stainless Steel Non-Labyrinth Options TS10N
(Position 1 for carbon steel shell valid for TS12N only)
(Position 21 valid for 320H only)



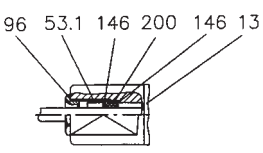
320L Stainless Steel with Labyrinth Options TS9N
(Position 1 for carbon steel shell valid for TS11N only)



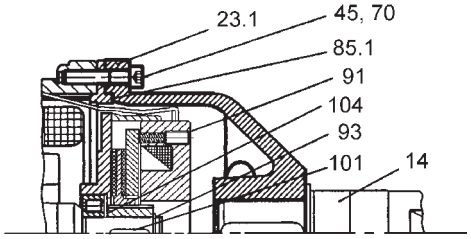
Elbow Connector



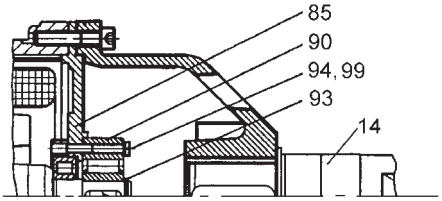
Straight Connector



Electromagnetic Brake Option

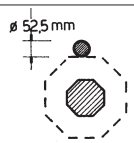
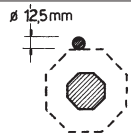
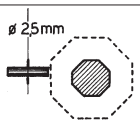
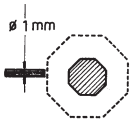
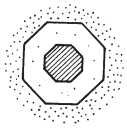
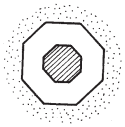


Backstop Option

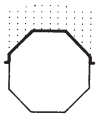
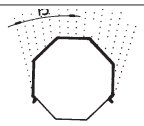
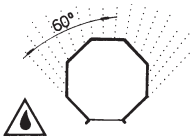
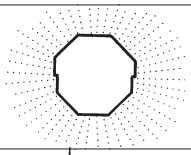
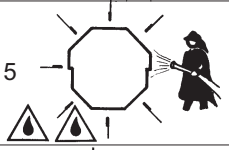
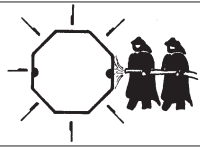
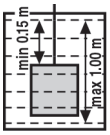
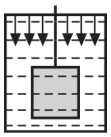


International Protection (IP) Ratings

Protection against solid bodies

IP	Symbol	Test Definition
0		Not Protected
1		Protected against touch with the flat of the hand and large solid objects greater than 50mm
2		Protected against finger-touch and solid objects greater than 12mm.
3		Protected against solid objects greater than 2.5mm
4		Protected against solid objects greater than 1.0mm.
5		Dust-protected! Dust shall not penetrate in a quantity to interfere with the satisfactory operation of the apparatus.
6		Dust-tight

Protection of internal equipment against harmful ingress of water

IP	Symbol	Test Definition
0		Not Protected!
1		Protected against dripping water.
2		Protected against dripping water when tilted up 15°.
3		Protected against spraying water.
4		Protected against splashing water.
5		Protected against water jets (P1 nozzle 6.3mm, water delivery rate 12.5 l/min ± 5%)
6		Protected from projections of water similar to marine swells (P2 nozzle 12.5mm, water delivery rate 100 l/min ± 5%)
7		Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily (30 min.) immersed 1 meter in water under standardized conditions of pressure and time
8		Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions, which shall be agreed between manufacturer and the user, but are more severe than for no. 7

Motorized Pulley 400L, 400M & 400H, Ø 15.91 in. (404 mm)

Our 15.91" diameter Motorized Pulley range offers three different performance levels for BULK applications:

- L for Light duty
- M for Medium duty
- H for Heavy duty

It is important to note the product differences and choose the appropriate pulley based on estimated belt tension (radial load.) See page 80. The actual radial load must be less than the maximum allowable radial load shown in this catalog.

Be aware of increased belt tensions required to drive multi-ply thick heavy belts and/or larger belt widths.

If the 15.91" diameter model is not strong enough to resist estimated belt tension, then select 19.72" diameter model.

L for Light duty

400L is designed for regular and continuous operating conditions. It is advisable to rubber lag these pulleys to grip the belt and limit belt tension. A popular application is self-cleaning magnetic separators. 400L uses motor and gearbox from 320M.

M for Medium duty

400M is designed for tough and irregular operating conditions. 400M is typically used in heavy mobile crushing & screening applications as well as in crushed stone, ore, cement, steel, and fertilizer handling.

H for Heavy duty

A solid 3-stage gearbox enables the 400H to provide low speed at high torque and handle irregular loadings in harsh operating conditions.

STANDARD SPECIFICATION of Motorized Pulley

- Crowned mild steel 15.91" diameter steel shell painted yellow at a minimum thickness of 2.4 mils
- Bolted powder coated cast iron bearing housings and covers, all painted yellow at a minimum thickness of 2.4 mils
- Mild steel shafts treated w/anti-rust wax
- Shaft sealing system - degree of protection IP66/67 (EN60034-5.) See pg 37.
- Powder coated aluminum terminal box for 400L
- Cast iron terminal box for 400M & 400H painted yellow at min.thickness of 2.4 mils
- 3-phase induction motors with thermal protector
- Voltage: All common voltages available. Please specify.
- Motor winding insulation Class H
- Dynamically balanced rotor
- Two oil plugs each fitted with a magnet to filter the oil
- Oil change recommended every 50,000 operational hours for synthetic oil (or 20,000 operational hours for mineral oil.)
- Minimum RL. Refer to pages 41-42.
- Maximum RL - Please inquire
- Non standard RL's available
- To be used in horizontal positions ±5 degree only

Please note:

- **Noise-sensitive Areas:** High speed 2-pole motors can cause higher noise levels and are not recommended for noise-sensitive areas
- **Technical Precautions for Design, Installation, and Maintenance:** pages 78-98.
- **Environmental Considerations:** pg 76-77.
- **Optional Extras:** pg 39 and back cover
- **Electrical Connection Diagrams:** pages 92-98.

STAINLESS STEEL options

TS9N
- Stainless steel shell - AISI 304 range
- Stainless steel shafts - AISI 303/4 range
- Stainless steel covered bearing housings - AISI 316 range
- Regreasable bearing covers with labyrinth grooves and labyrinth seals with grease nipples in stainless steel - AISI 304 range
- Stainless steel oil plugs - AISI 304 range — one out of two with magnet
- Stainless steel exterior bolts - AISI 304 range
- Shaft sealing system — degree of protection IP66/67 (EN60034-5) See pg 37.

TS10N
- As TS9, but without regreasable labyrinth seals

SEMI-RUST-FREE options

TS 11N
- Painted mild steel shell — min. thickness of 4.7 mils
- Stainless steel shafts - AISI 303/4 range
- Stainless steel covered cast iron bearing housing - AISI 316 range
- Regreasable bearing covers with labyrinth grooves and grease nipples in stainless steel - AISI 304 range
- Stainless steel oil plugs — AISI 304 range - one out of two with magnet
- Stainless steel exterior bolts - AISI 304 range
- Shaft sealing system - degree of protection IP66/67 (EN60034-5)
- Powder coated terminal box for 400L
- Painted terminal box - min. thickness of 4.7 mils for 400M & 400H

TS12N
- As TS11N, but without regreasable seals.
- Covers - standard

Other Stainless Options:

- FDA & USDA food grade recognized oil and grease are not included in TS9N - TS12N, but available on request
- Complete Motorized Pulleys in acid resistant stainless steel - AISI 316 range - available on request.
- Special mounting brackets available

Electrical connection options:

- Salt water resistant powder coated aluminum terminal box with zinc plated exterior bolts
- Stainless steel terminal box - AISI 304 range (400L ≤ 5.5 HP only)
- Straight stainless steel connector with flying lead - AISI 304 range ≤ 5.5 HP only.

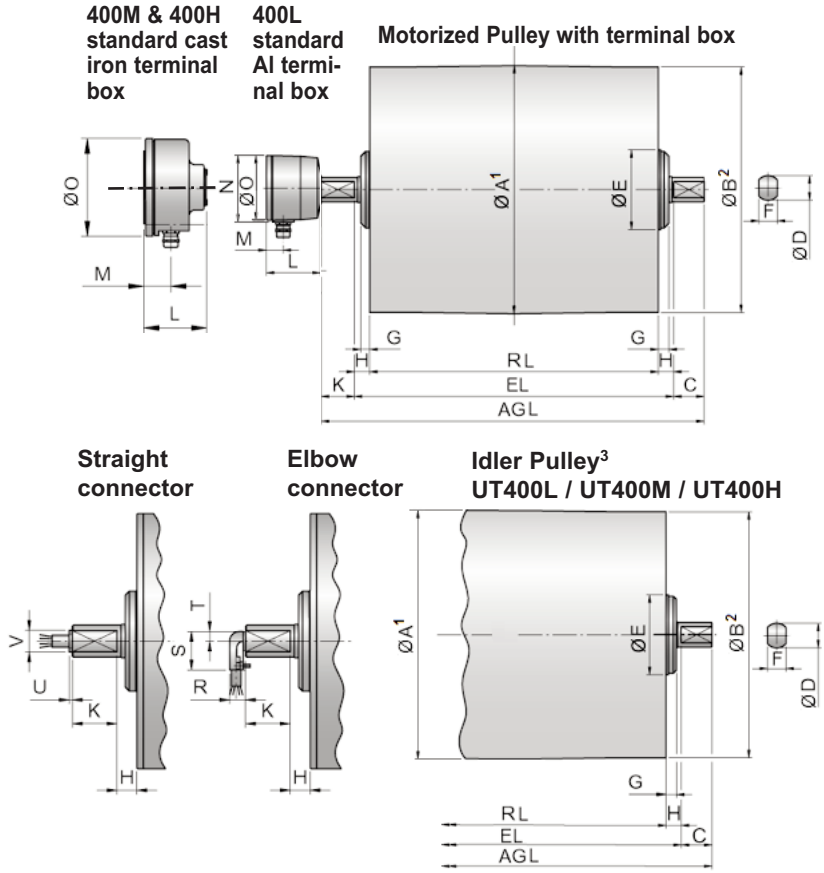
Please specify required TS-number when ordering Stainless Steel options..

OPTIONAL EXTRAS
Motorized Pulley 400L, 400M & 400H

Specification				Availability
Total stainless steel option AISI 304 range	TS9N	with regreasable labyrinth seals		x
Total stainless steel option AISI 304 range	TS10N	with standard seals		x
Semi-rust free option	TS11N	with regreasable labyrinth seals		x
Semi-rust free option	TS12N	with standard seals		x
Regreasable labyrinth seals				x
Food grade oil & grease - FDA & USDA recognized				x
Dust explosion proof Motorized Pulleys - ATEX 95 - Zone 22 - for applications handling of dusty grain etc. According to European Directive 94/9/EC.				o
Total acid resistant stainless steel option - AISI 316 range				x
Black rubber lagging - Standard specifications (See page 82-83.)				
5/16" full diamond lagging - Hardness 60 ±5 Shore A			≤ 15 HP	o
5/16" partial diamond lagging - Hardness 60 ±5 Shore A			20 HP	o
White smooth rubber lagging (FDA listed) - Oil, fat & grease resistant				o
Special lagging (e.g. hot vulcanized)				o
Electromagnetic brake		Min RL increases by 3.94"		x
Mechanical backstop		Min. RL increases by 1.97" for 400L		x
		Min. RL = 29.53" for 400M		x
		Min. RL = 31.50" for 400H		x
Modified for vertical mounting				o
Modified for mounting between 5° and 90°				o
Insulation class F with standard oil: (Allowable ambient temperature -13°F/+104°F)				x
Insulation class H with synthetic oil: (Allowable ambient temperature -13°F/+120°F)				Std.
Special motors for applications with no belt contact				o
Low noise drives for noise sensitive areas				x
Parallel shell (i.e. no crown)				x
Thermal protector				Std.
IP66/67 Standard yellow powder coated aluminum terminal box			400L	Std.
IP66/67 Optional gray powder coated aluminum terminal box (food grade approved)			400L	x
IP66/67 Standard yellow powder coated cast iron terminal box			400M & 400H	Std.
Straight or elbow connector with standard power cord		400L	≤ 5.5 HP only	x
Straight connector with screened power cord (See page 86 for VFD precautions)		400L	≤ 5.5 HP only	x
Straight connector with power cord (Stainless steel in AISI 304 range)		400L	≤ 5.5 HP only	x
Voltage: single voltage (460) stator (Y winding) wired for 460v/3ph/60 Hz at terminal box				Std
single voltage (230) stator (Y winding) wired for 230v/3ph/60 Hz at terminal box				x
Special voltage motors				x
CSA approved motors				x

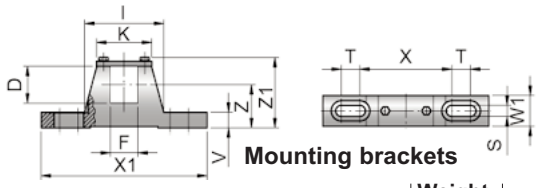
x = Optional extras
o = An option with certain limitations. Please refer to Technical precautions pages 78-98.
Std. = Fitted as standard

Motorized Pulley 400L, 400M & 400H, Ø 15.91 in. (404 mm)



Model	Motorized Pulley or idler Pulley A in	B in	C in	D in	E in	F in	G in	H in	K in	Standard terminal box L in	M in	N in	O in	Straight connector ≤ 5.5 HP U in	V in	Elbow connector ≤ 5.5 HP R in	S in	T in
400L	15.91	15.75	1.97	1.57	4.92	1.18	0.79	0.98	2.13	3.43	1.06	4.21	4.13	0.16	1.06	0.79	1.89	0.47
400M & 400H	15.91	15.75	1.97	2.36	7.64	1.77	0.91	0.98	1.97	3.94	1.44	—	6.14	—	—	—	—	—
UT400L	15.91	15.91	1.97	1.57	4.92	1.18	0.67	0.98	—									
UT400M & UT400H	15.91	15.91	1.97	2.36	6.61	1.77	0.79	0.98	—									

1 A dimension is outer diameter of unlagged pulley shell at pulley centerline.
2 B dimension is outer diameter of unlagged pulley shell at each end of shell.
3 Idler pulley shown is non-crowned TS9N/TS11N version with regreasable seals.



Mounting brackets

Motorized Pulleys Model	Material	Bracket Size	Part Number	Dimensions D in	F in	I in	K in	S in	T in	V in	W1 in	X in	X1 in	Z in	Z1 in	Weight lbs
400L	Steel painted	KL4-HD	6YA0K	1.57	1.18	3.31	2.44	0.55	0.79	0.87	1.57	4.33	7.48	1.97	3.27	4.63
	Steel Ni plated		6YA0W													
	Stainless steel		6YA0U													
400M & 400H	Steel painted	KL60	6YA09	2.36	1.77	5.12	3.54	0.71	1.18	0.98	1.97	5.91	10.63	2.76	4.53	10.58
	Steel Ni plated		6YA0D													

Motorized Pulley 400L, Ø 15.91 in. (404 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5]											Type of Bracket
Power HP	No. of Poles								19.69	21.65	23.62	25.59	27.56	29.53	31.50	33.46	35.43	37.40	longer than 37.40	
3	4	2	400L	192 240 300 384 480 600	201 240 303 395 498 613	460 385 305 234 186 151	4496	19.69	276	288	300	312	324	337	349	361	373	385	See Footnote[4]	KL41-HD 6YA0K
4	4	2	400L	150 192 240 300 384 480 600	163 201 240 303 395 498 613	771 627 524 416 319 253 206	4496	19.69	276	288	300	312	324	337	349	361	373	385		
5.5	4	2	400L	192 240 300 384 480 600	201 240 303 395 498 613	836 700 554 425 338 274	4496	19.69	298	310	322	334	346	359	371	383	395	407		
7.5	4	2	400L	300 384 480 600	303 395 498 613	778 598 474 386	4496	19.69	298	310	322	334	346	359	371	383	395	407		
10	2	2	400L	384 480 600 760	T402 481 607 791	784 655 520 399	4496	19.69	298	310	322	334	346	359	371	383	395	407		
									← Special RL			Standard RL →								
Idler Pulley			Model UT400L				4496	19.69	188	200	212	224	236	249	261	273	285	297	See Footnote[4]	KL41-HD 6YA0K

1 Use "nominal belt speed" to specify pulley. "Actual belt speed" is presented (for pulley lagged with 5/16" thick rubber) to assist with process design calculations. See Technical Precautions page 79. Note that "actual belt speed" decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding "Maximum radial load" defined above. See "Belt Tension" section in Technical Precautions, page 80.

4 Additional Motorized Pulley and Idler Pulley weight, specified per Roller Length: 37.40"≤ RL ≤ 78.74" Wt = 6.2 lbs/in.

5 All weights shown above are for pulleys with 5/16" thick lagging and do not include mounting brackets. To calculate unlagged pulley weight subtract 0.6 lbs/in of Roller Length from above.

Motorized Pulley 400M & 400H, Ø 15.91 in. (404 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5]									Type of Bracket
Power HP	No. of Poles								23.62	25.59	27.56	29.53	31.50	33.46	35.43	37.40	39.37	longer than 39.37	
3	8	3	400H	38 48 60	44 54 64	2121 1725 1442	11,250	25.59	-	533	547	563	577	591	605	619	634	See Footnote[4]	KL60 6YA09
		2	400M	76 96 120 150 192 240 300 384	82 101 121 152 197 248 307 390	1131 920 770 610 468 371 302 238	9,100	23.62	442	456	470	485	500	514	528	542	557		
5.5	8	3	400H	48 60 76	54 64 81	3137 2623 2079	11,250	25.59	-	553	567	582	597	611	625	639	654		
		2	400M	96 120 150 192 240 300 384	101 121 152 197 248 307 390	1673 1399 1108 851 675 548 432	9,100	23.62	462	476	490	505	519	534	548	562	576		
7.5	4	3	400H	76 96 120	87 107 128	2651 2156 1803	11,250	25.59	-	533	547	563	577	591	605	619	634		
		2	400M	150 192 240 300 384 480 600 760	163 201 240 303 395 498 613 778	1413 1150 962 762 585 465 377 297	9,100	23.62	442	456	470	485	500	514	528	542	557		
10	6	3	400H	96 120 150	108 140 177	2923 2244 1782	11,250	29.53	-	-	-	602	616	631	645	659	673		
	4	2	400M	192 240 300 384 480 600 760	201 240 303 395 498 613 778	1568 1311 1039 798 633 515 405	9,100	23.62	455	469	483	499	513	527	541	556	570		
15	4	3	400H	150 192 240	162 211 265	2859 2194 1742	11,250	29.53	-	-	-	602	616	631	645	659	673		
		2	400M	300 384 480 600 760	303 395 498 613 778	1525 1170 929 754 594	9,100	27.56	-	-	510	525	539	554	568	582	596		
20	2	3	400H	192 240 300	214 257 323	2940 2459 1949	11,250	29.53	-	-	-	602	616	631	645	659	673		
		2	400M	384 480 600 760	402 481 607 791	1568 1311 1039 798	9,100	27.56	-	-	510	525	539	554	568	582	596		
									← Special RL			Standard RL →							
Idler Pulley			UT400M			9,100	23.62	264	277	294	309	323	333	347	362	376	See Footnote[4]	KL60 6YA09
			UT400H			11,250	25.59	-	288	305	320	334	344	358	373	387		

1 Use "nominal belt speed" to specify pulley. "Actual belt speed" is presented (for pulley lagged with 5/16" thick rubber) to assist with process design calculations. See Technical Precautions page 77. Note that "actual belt speed" decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding "Maximum radial load" defined above. See "Belt Tension" section in Technical Precautions, page 80.

4 Additional Motorized Pulley and Idler Pulley weight, specified per Roller Length: 39.37"≤ RL ≤ 78.74" Wt = 7.3 lbs/in.

5 All weights shown above are for pulleys "fully lagged" with 5/16" thick rubber and do not include mounting brackets. For "partially lagged" pulleys add 5% to 10% to the weights shown above. See pages 47, 82 and 83 for "partial lagging." To calculate unlagged pulley weight subtract 0.6 lbs/in of Roller Length from above.

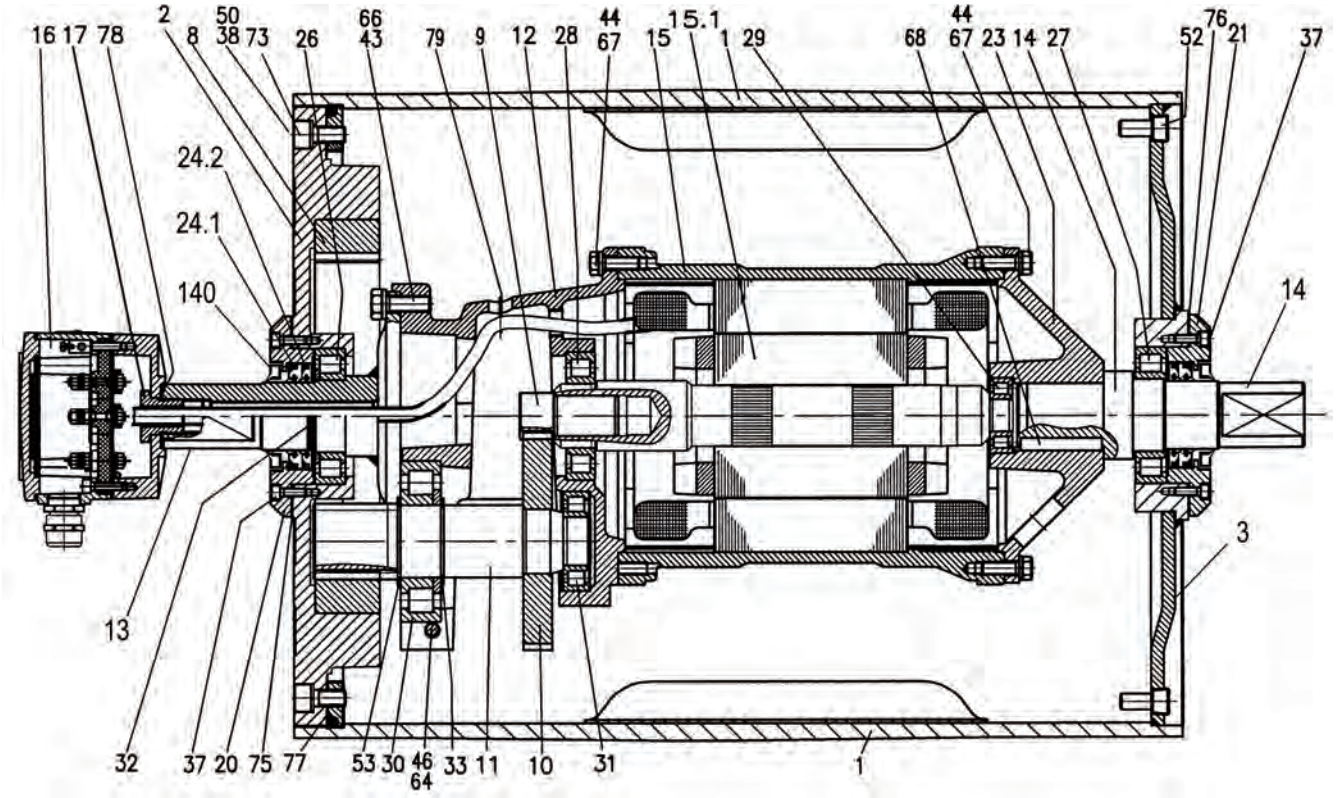
Motorized Pulley 400L, Ø 15.91 in. (404 mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
1.1	Shell (ss option)
2	End housing with geared rim
2.1	End housing (ss option)
3	End housing
3.1	End housing (ss option)
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box — cast aluminum
13	Front shaft
13.1	Front shaft (ss option)
14	Rear shaft
14.1	Rear shaft (ss option)
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
20	Cover — front side
20.1	Cover with labyrinth groove
21	Cover — rear side
21.1	Cover with labyrinth groove
23	Rear flange
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner

Pos.	Description
24.3	Shaft oil seal outer (lab option)
24.4	Shaft oil seal inner (lab option)
26	Bearing
27	Bearing
28	Bearing
29	Bearing
30	Bearing
31	Bearing
32	Retaining ring
33	Retaining ring
37	Hexagon socket screw
38	Hexagon socket screw
43	Hexagon screw
44	Hexagon screw
45	Hexagon socked head screw
46	Hexagon screw
49	Washer
50	Washer
52	Magnetic oil plug
52.1	Magnetic plug (ss option)
53	Distance washer
53.1	Compression nipple
60	Parallel pin
64	Prevailing torque type hex nut
66	Waved spring washer
67	Waved spring washer

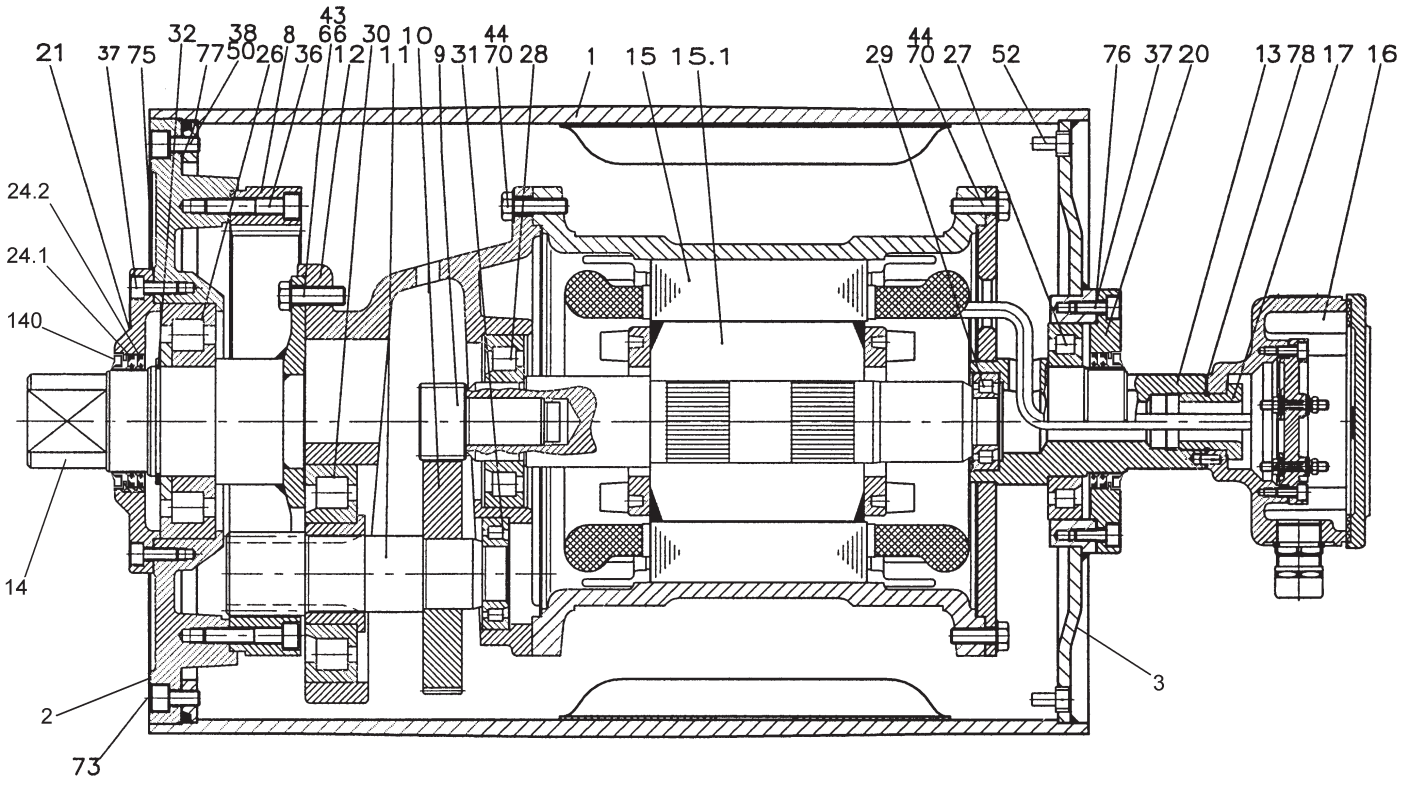
Pos.	Description
68	Key
73	Set screw
75	Gasket
76	Gasket
77	Gasket
78	Gasket
79	Holding clip or plastic tie
85	Intermediate flange for backstop
85.1	Intermediate flange for brake
90	Backstop
91	Electromagnetic brake
93	Retaining ring
94	Hexagon head screw
95	Straight connector
96	Elbow connector
99	Waved spring washer
101	Key
104	Distance washer
120	Labyrinth cover
121	Set screw
122	O-ring
123	Grease nipple
140	Deflection seal
143	O-ring
146	Special compression washer
200	Rubber seal



Motorized Pulley 400M, Ø 15.91 in. (404 mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
1.1	Shell (ss option)
2	End housing with geared rim
2.1	End housing (ss option)
3	End housing
3.1	End housing (ss option)
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box — cast aluminum
13	Front shaft
13.1	Front shaft (ss option)
14	Rear shaft
14.1	Rear shaft (ss option)
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
20	Cover — front side
20.1	Cover with labyrinth groove
21	Cover — rear side
21.1	Cover with labyrinth groove
23	Rear flange
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal outer (lab option)
24.4	Shaft oil seal inner (lab option)
26	Bearing
27	Bearing
28	Bearing
29	Bearing
30	Bearing
31	Bearing
32	Retaining ring
36	Hexagon head screw
45	Hexagon screw
50	Waved spring washer
52	Magnetic oil plug
52.1	Magnetic oil plug (ss option)
37	Hexagon socket screw
38	Hexagon socket screw
43	Hexagon screw
44	Hexagon screw
52	Magnetic oil plug
53	Distance washer
66	Waved spring washer
67	Waved spring washer
70	Spring washer
73	Set screw
75	Gasket
76	Gasket
77	Gasket
78	Gasket
85	Intermediate flange
90	Backstop
91	Electromagnetic brake
93	Retaining ring
94	Hexagon head screw
99	Waved spring washer
101	Key
104	Distance washer
120	Labyrinth cover
121	Set screw
122	O-ring
123	Grease nipple
140	Deflection seal

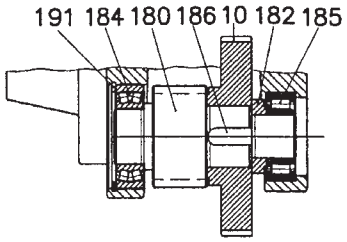


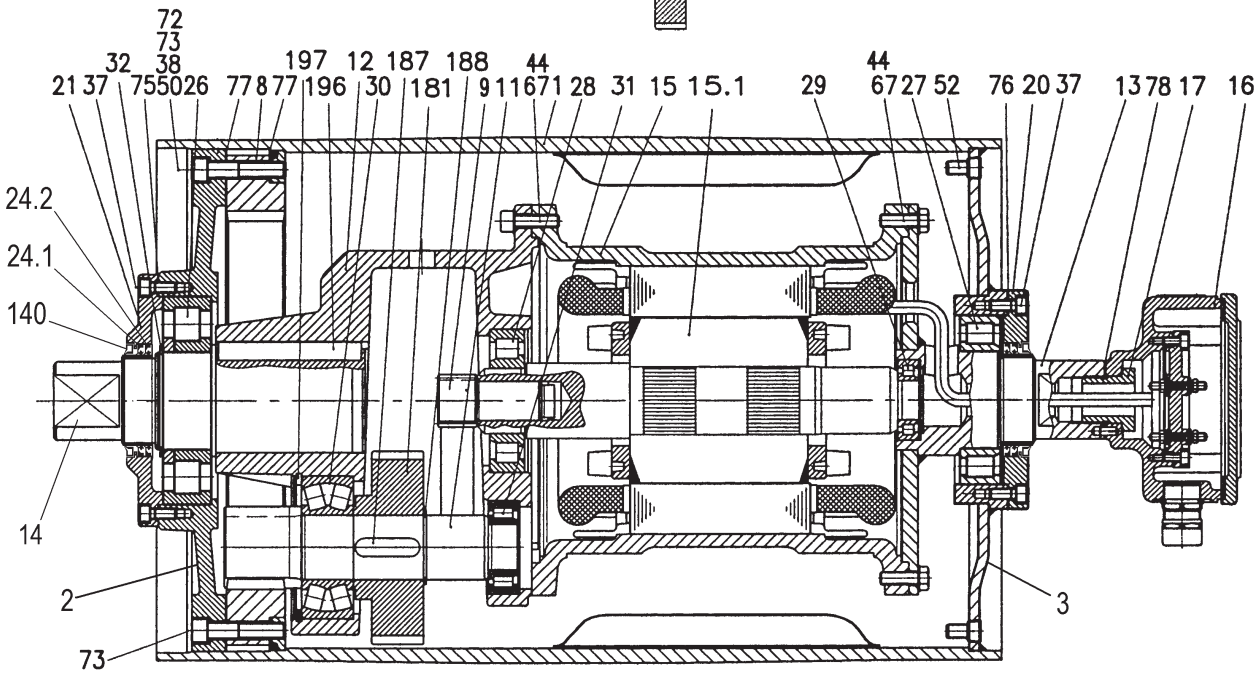
Motorized Pulley 400H, Ø 15.91 in. (404 mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
1.1	Shell (ss option)
2	End housing with geared rim
2.1	End housing (ss option)
3	End housing
3.1	End housing (ss option)
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box — cast iron
13	Front shaft
13.1	Front shaft (ss option)
14	Rear shaft
14.1	Rear shaft (ss option)
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
20	Cover Front side
20.1	Cover with labyrinth groove
21	Cover rear side
21.1	Cover with labyrinth groove
23	Rear flange
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal outer (lab option)
24.4	Shaft oil seal inner (lab option)
26	Bearing
27	Bearing
28	Bearing
30	Bearing
31	Bearing
32	Retaining ring
33	Retaining ring
36	Hexagon socket screw
37	Hexagon socket screw
38	Hexagon socket screw
43	Hexagon socket screw
44	Hexagon socket screw
45	Hexagon socket screw
50	Waved spring washer
52	Magnetic oil plug
52.1	Magnetic oil plug (ss option)
53	Distance washer
66	Waved spring washer
72	Taper grooved pin
73	Set screw
75	Gasket
76	Gasket
77	Gasket
78	Gasket
85	Intermediate flange for brake
90	Backstop
91	Electromagnetic brake
93	Retaining ring
94	Hexagon head screw
99	Waved spring washer
101	Key
104	Distance washer
120	Labyrinth cover
121	Set screw
122	O-ring
123	Grease nipple
140	Deflection seal
180	Intermediate pinion shaft
181	Intermediate wheel
182	Distance washer
183	Distance washer
184	Roller bearing
185	Roller bearing
186	Key
187	Key
188	Retaining ring
190	Retaining ring
191	Retaining ring
194	Set screw
196	Key
197	Retaining ring

Intermediate pinion shaft

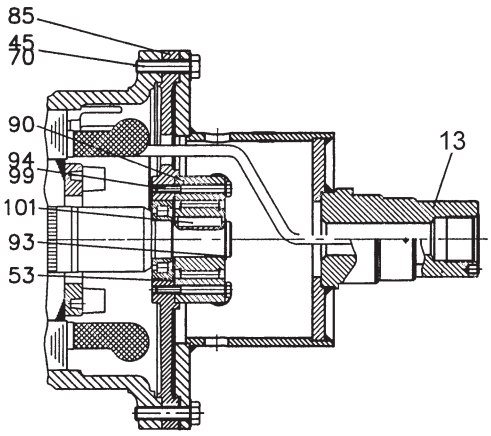




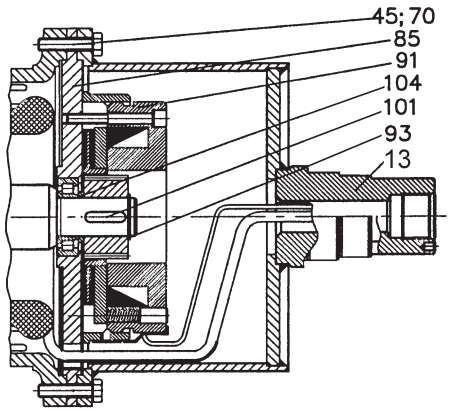
Motorized Pulley 400L, 400M & 400H, Ø 15.91 in. (404 mm)

Sectional drawings

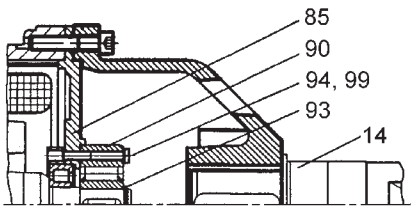
Backstop Option (valid for 400M & 400H)



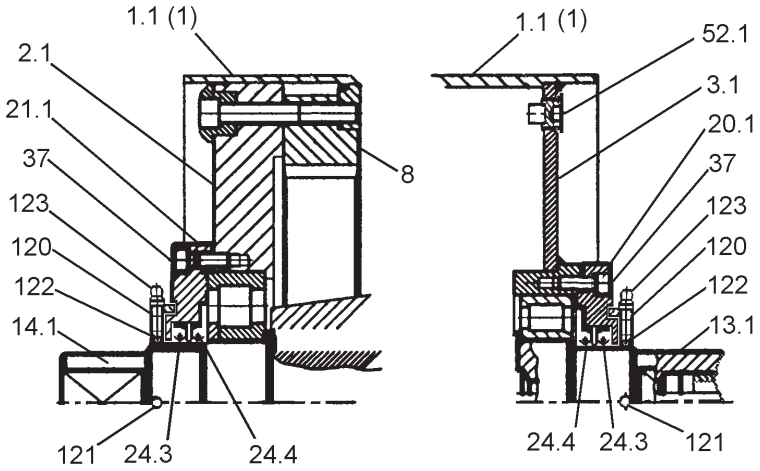
Electromagnetic Brake Option (valid for 400M & 400H)



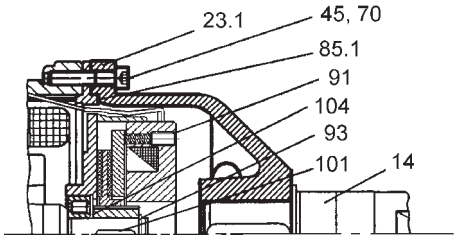
Backstop Option (valid for 400L)



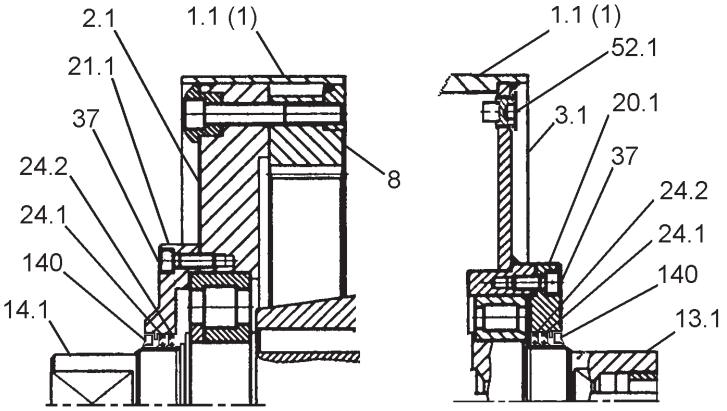
Stainless Steel with Labyrinth Options TS9N
(Position 1 for carbon steel shell valid for TS11N only)



Electromagnetic Brake Option (valid for 400L)



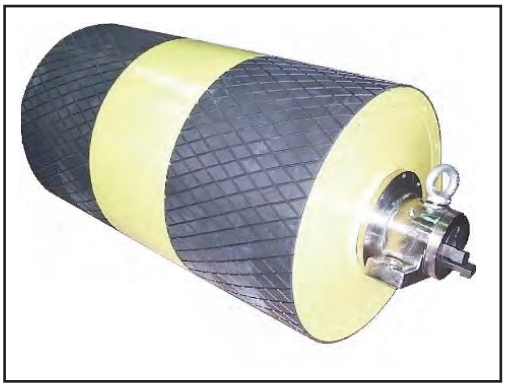
Stainless Steel Non-Labyrinth Options TS10N
(Position 1 for carbon steel shell valid for TS12N only.)



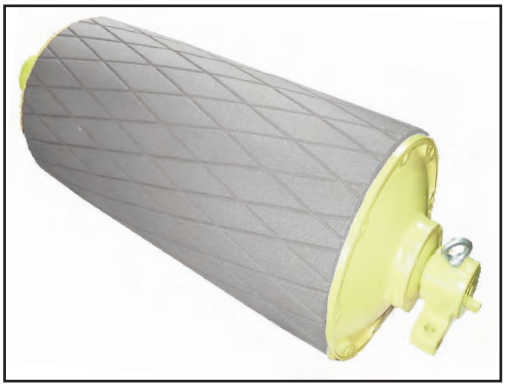
Motorized Pulleys
Lagging Options

"Full" Diamond Pattern Synthetic Rubber
Most popular lagging is 0.24", 0.32", and 0.39" thick cold-bonded black diamond pattern synthetic rubber lagging in 60 durometer +/- 5 (shore hardness A.) This long-lasting material has excellent frictional characteristics in wet or dry, outdoor and indoor applications for single direction and reversing belts. As described on pages 82 & 83, other thicknesses are available as well as smooth, white, oil-resistant, and MSHA rubber. Hot vulcanized bonding is also available.

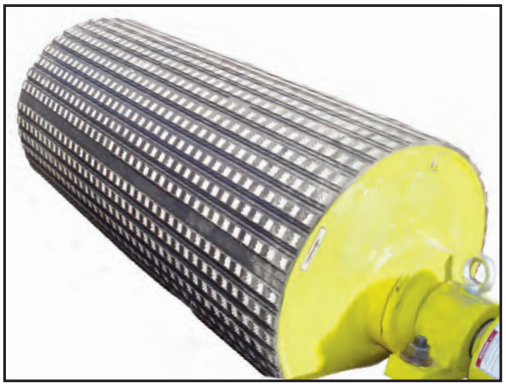
Technical Precaution: Lagging thickness effects pulley heat dissipation characteristics. Refer to "Lagging Limitations" chart on page 83.



"Partial" Diamond Pattern Synthetic Rubber
Certain power and belt speed combinations require that lagging be restricted to the outer thirds of the pulley face to improve heat dissipation. Each "partially lagged" pulley has an extra thick steel pulley shell in the center of the pulley face. Most popular partial lagging is 0.39" thick cold-bonded black diamond pattern synthetic rubber lagging in 60 durometer +/- 5 (shore hardness A.) As described on pages 82 & 83, other thicknesses are available as well as smooth, white, oil-resistant, and MSHA rubber. Hot vulcanized bonding is also available.



Ceramic - Solid
Solid ceramic lagging is available which is bonded directly to steel pulley face in both diamond pattern (shown in adjacent
\photo) and rectangular pattern (shown on page 74.) Due to the excellent heat transfer proporties of the ceramic material, this lagging is available on the full pulley face regardless of model, power, face width, and belt speed. The porous ceramic material offers a high frictional coefficient and excellent resistance to wear.



Ceramic - Segments Embedded in Rubber
Ceramic plates embedded in rubber offer a good solution for conveyor applications with high wet silt content (e.g. stone and mud handling) or hard material (e.g. taconite pellet handling), especially for drive pulleys working on the "dirty side" of the belt. Since ceramic plates are non-porous, silty material is less likely to plug pores and cause friction loss. Since plates are "cushioned" in rubber, hard material is less likely to crush ceramic lagging between belt and steel pulley face. However, the heat transfer capability of this lagging is not as efficient as solid ceramic. Therefore, partial lagging is required on certain model, power, face width, and belt speed combinations, as described on pages 82 and 83.

Motorized Pulley 500L, 500M & 500H, Ø 19.72 in. (501 mm)

Our 19.72" diameter Motorized Pulley range offers three different performance levels for BULK applications:

- L for Light duty
- M for Medium duty
- H for Heavy duty

It is important to notice the product differences and choose the appropriate pulley based on estimated belt tension (radial load.) See page 80. The actual radial load must be less than the maximum allowable radial load shown in this catalog.

Be aware of increased belt tensions required to drive multi-ply thick heavy belts and/or larger belt widths.

If the 19.72" diameter model is not strong enough to resist estimated belt tension, then select 24.80" diameter model.

L for Light duty

500L is designed for tough and irregular operating conditions. 500L is typically used in heavy mobile crushing & screening applications as well as in crushed stone, ore, cement, steel, and fertilizer handling. 500L uses motor and gearbox from 400M. Note that 500L outer dimensions do not match 500H (Former models TM500 and TM501).

M for Medium duty

A solid 3-stage gearbox enables the 500M to provide low speed at high torque and handle irregular loadings in harsh operating conditions. 500M uses motor and gearbox from 400H. Note that 500M outer dimensions do not match 500H (Former models TM500 and TM501).

H for Heavy duty

500H has strongest internal components in this diameter with gearbox, shaft, and bearings designed for tough, irregular, and extreme operating conditions.

STANDARD SPECIFICATION of Motorized Pulley

- Crowned mild steel 19.72" diameter steel shell painted yellow at a minimum thickness of 2.4 mils
- Bolted powder coated cast iron bearing housings and covers, all painted yellow at a minimum thickness of 2.4 mils
- Mild steel shafts with nitrided shaft sleeves valid for 500H.
- Shaft sealing system - degree of protection IP66/67 (EN60034-5.) See page 37.
- Cast iron terminal box for painted yellow at min.thickness of 2.4 mils
- 3-phase induction motors with thermal protector
- Voltage: All common voltages available. Please specify.
- Motor winding insulation Class H
- Dynamically balanced rotor
- Two oil plugs each fitted with a magnet to filter the oil
- Black painted mounting brackets (KL60) for 500L and 500M available on request
- Yellow painted mounting brackets (AL65 & ALO65) included with 500H
- Oil change recommended every 50,000 operational hours for synthetic oil (or 20,000 operational hours for mineral oil)
- Minimum RL. Refer to pages 51 & 53
- Maximum RL - Please inquire
- Non standard RL's available
- To be used in horizontal positions ±5 degree only

Please note:

- **Noise-sensitive Areas:** High speed 2-pole motors can cause higher noise levels and are not recommended for noise-sensitive areas
- **Technical Precautions for Design, Installation, and Maintenance:** pages 78-98
- **Environmental Considerations:** page 76-77
- **Optional Extras:** page 49 and back cover
- **Electrical Connection Diagrams:** pages 92-98.

SEMI-RUST-FREE options

TS11 – (500L & 500M)

- Painted mild steel shell at minimum thickness of 4.7 mils
- Stainless steel shafts — AISI 303/4 range
- Painted cast iron end housings at minimum thickness of 4.7 mils
- Stainless steel bearing covers with labyrinth grooves and grease nipples — AISI 304 range
- Zinc plated oil plugs each with magnet
- Zinc plated exterior bolts
- Shaft sealing system — degree of protection IP66/67 (EN60034-5.) See page 37.
- Painted terminal box at minimum thickness of 4.7 mils
- Nickel plated mounting brackets are available

TS11 – (500H)

- Painted mild steel shell at minimum thickness of 4.7 mils
- Painted cast iron end housings at minimum thickness of 4.7 mils
- Stainless steel covers with labyrinth grooves — AISI 304 range
- Nitrided shaft sleeves
- Zinc-plated oil plugs - each with magnet
- Zinc-plated exterior bolts
- Shaft sealing system — degree of protection P66/67 (EN60034-5) See pg 88.
- Painted terminal box at minimum thickness of 4.7 mils
- Nickel plated mounting brackets with labyrinth grooves

TS12

- As TS11, but without regreasable seals.
- Covers - standard

Please note:

- FDA & USDA food grade recognized oil and grease are not included in TS11 & TS12, but available on request

Please specify required TS-number when ordering Stainless Steel options.

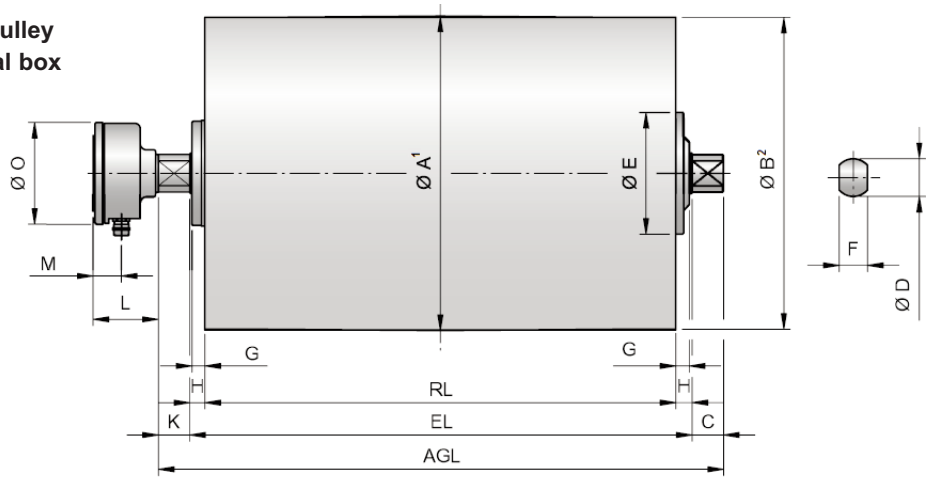
OPTIONAL EXTRAS
Motorized Pulley 500L, 500M & 500H

Specification		Availability
Semi-rust-free option	TS11 with regreasable labyrinth seals	x
Semi-rust-free option	TS12 with standard seals	x
Regreasable labyrinth seals		x
Dust explosion proof Motorized Pulleys - ATEX 95 - Zone 22 - for applications handling of dusty grain etc. According to European Directive 94/9/EC.		o
Standard black rubber lagging (See page 82-83.)		
3/8” full smooth lagging -	Hardness 60 ±5 Shore A	o
3/8” full diamond lagging -	Hardness 60 ±5 Shore A	o
3/8” partial smooth lagging -	Hardness 60 ±5 Shore A	o
Special lagging - e.g. hot vulcanized, partial, and ceramic (See page 80.)		o
Internal electromagnetic brake (not available in 500H)	Min. RL increases by 3.94” for 500L and 500M	x
External brake shaft (for mechanical brake by others)	Only available in 500H	x
Mechanical backstop	Min. RL = 29.53” for 500L	x
	Min. RL = 31.50” for 500M	x
	Min. RL = 29.53” for 500H	x
Insulation class F with standard oil: (allowable ambient temperature: -13°F/+104°F)		x
Insulation class H with synthetic oil: (allowable ambient temperature: -13°F/+120°F)		Std.
Parallel shell		x
Thermal protector		Std.
Voltage: Single voltage (460) stator (Y winding) wired for 460v/3ph/60 Hz at terminal box		Std.
IP66/67 Standard yellow powder coated cast iron terminal box		Std.
Special voltage motors		x
CSA approved motors		x

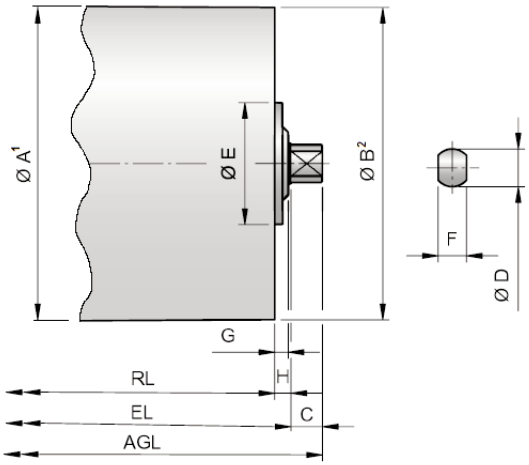
x = Optional extras
o = An option with certain limitations. Please refer to Technical precautions pages 78-98.
Std. = Fitted as standard

Motorized Pulley 500L & 500M, Ø 19.72 in. (501 mm)

Motorized Pulley with terminal box



Idler Pulley[3] UT400M & UT400H

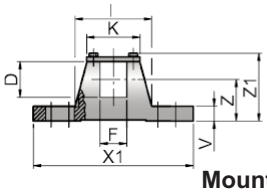


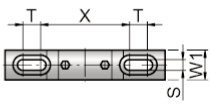
Model	Motorized Pulley or Idler Pulley A in	B in	C in	D in	E in	F in	G in	H in	K in	Standard terminal box L in	M in	N in	O in
500L & 500M	19.72	19.57	1.97	2.36	7.64	1.77	0.91	0.98	1.97	3.94	1.44	—	6.14
UT400M & UT400H	15.91	15.91	1.97	2.36	6.61	1.77	0.79	0.98	—				

1 A dimension is outer diameter of unlagged pulley shell at pulley centerline.

2 B dimension is outer diameter of unlagged pulley shell at each end of shell.

3 Idler pulley shown is non-crowned version.





Motorized Pulleys & Idlers Model	Material	Bracket Size	Part Number	Dimensions D in	F in	I in	K in	S in	T in	V in	W1 in	Mounting bracket X in	X1 in	Z in	Z1 in	Weight lbs
500L, 500M, UT400M, & UT400H	Steel painted	KL60	6YA09	2.36	1.77	5.12	3.54	0.71	1.18	0.98	1.97	5.91	10.63	2.76	4.53	10.58
	Steel Ni plated		6YA0D													

Motorized Pulley 500L & 500M, Ø 19.72 in. (501 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5]									Type of Bracket
Power HP	No. of Poles								23.62	25.59	27.56	29.53	31.50	33.46	35.43	37.40	39.37	longer than 39.37"	
3	8	3	500M	48 60 76	55 67 80	1696 1380 1154	9487	25.59	-	593	610	628	645	663	680	697	715	See Foot-note[4]	KL60 6YA09
		2	500L	96 120 150 192 240	102 126 151 190 247	905 736 616 487 375	7868	23.62	498	516	533	550	568	585	603	620	638		
5.5	8	3	500M	76 96 120	80 101 126	2098 1663 1338	9487	25.59	-	613	630	647	665	682	699	717	735		
		2	500L	150 192 240 300 384 480	151 190 247 311 383 487	1119 887 681 540 439 346	7868	23.62	518	535	553	570	588	605	623	640	657		
7.5	4	3	500M	120 150 192	134 160 202	1725 1442 1144	9487	25.59	-	593	610	628	645	663	680	697	715		
		2	500L	240 300 384 480 600 760	251 301 379 494 622 766	920 770 610 468 372 302	7868	23.62	498	516	533	550	568	585	603	620	638		
10	6	3	500M	150 192 240	175 221 272	1795 1425 1157	9487	29.53	-	-	-	641	658	676	693	711	728		
	4	2	500L	300 384 480 600 760	301 379 494 622 766	1049 831 639 507 411	7868	23.62	511	529	546	564	581	599	616	633	651		
15	4	3	500M	240 300 384	251 301 379	1840 1538 1220	9487	29.53	-	-	-	667	685	702	720	737	755		
		2	500L	480 600 760	494 622 766	936 743 604	7868	27.56	-	-	573	590	608	625	642	660	677		
20	2	3	500M	300 384 480	321 405 527	1967 1560 1196	9487	29.53	-	-	-	667	685	702	720	737	755		
		2	500L	600 760	601 759	1049 831	7868	27.56	-	-	573	590	608	625	642	660	677		
									← Special RL			Standard RL →							

Idler Pulley	UT400M	9,100	23.62	271	286	304	319	334	345	360	376	391	See Foot-note[4]	KL60 6YA09
	UT400H	11,250	25.59	-	295	315	330	345	356	371	387	402		

1 Use "nominal belt speed" to specify pulley. "Actual belt speed" is presented (for pulley lagged with 3/8" thick rubber) to assist with process design calculations. See Technical Precautions page 79. Note that "actual belt speed" decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

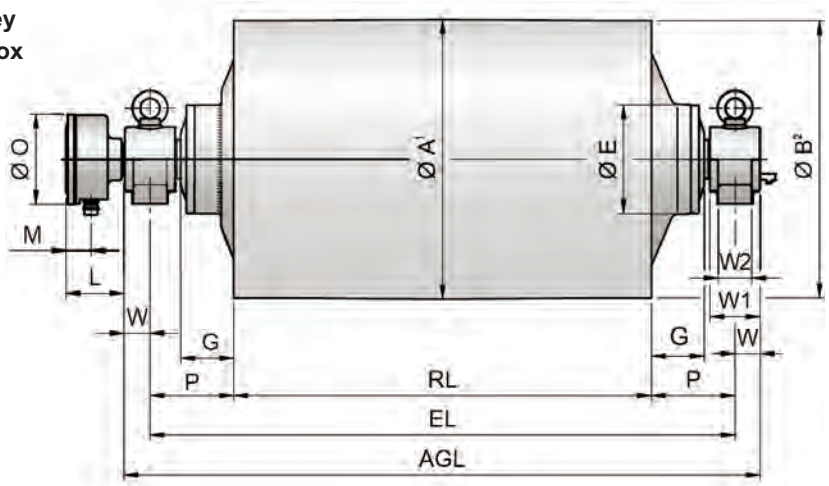
3 Pulley must not be subjected to radial load exceeding "Maximum radial load" defined above. See "Belt Tension" section in Technical Precautions, page 80.

4 Additional Motorized Pulley weight, specified per Roller Length: 39.37" ≤ RL ≤ 78.749" Wt = 8.7 lbs/in.

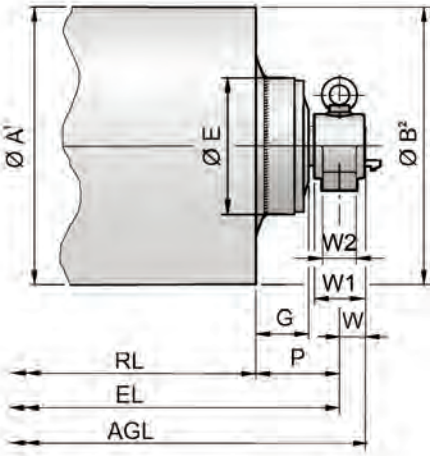
5 All weights shown above are for pulleys "fully lagged" with 3/8" thick rubber and do not include mounting brackets. For "partially lagged" pulleys add 5% to 10% to th weights shown above. See Pages 47, 82 and 83 for "partial lagging." To calculate unlagged pulley weight subtract 0.9 lbs/in of Roller Length from above.

Motorized Pulley 500H, Ø 19.72 in. (501 mm)

Motorized Pulley with terminal box



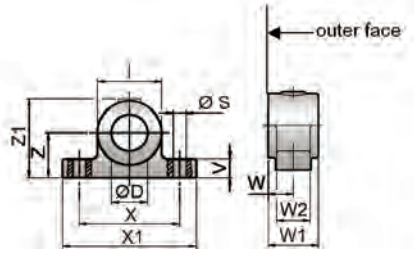
Idler Pulley³ UT500H



Motorized Pulley or Idler Pulley

Model	A in	B in	C in	D⁴ in	E in	G in	L in	M in	O in	P in
500H	19.72	19.57	—	2.56	7.56	3.74	3.94	1.44	6.14	5.91
UT500H	19.72	19.72	—	2.56	9.25	3.74	—	—	—	5.91

1 A dimension is outer diameter of unlagged pulley shell at pulley centerline.
2 B dimension is outer diameter of unlagged pulley shell at each end of shell.
3 Idler pulley shown is non-crowned version.
4 D dimension is shaft diameter.



Mounting bracket*

Motorized Pulleys & Idler Pulleys Model	Material	Bracket Size*	Dimensions D in	I in	S in	V in	W in	W1 in	W2 in	X in	X1 in	Z in	Z1 in	Weight lbs
500H & UT500H	Cast iron	AL65 / ALO65	2.56	4.53	0.91	1.34	1.85	3.54	2.36	7.09	9.45	3.15	5.55	17.64

* Type AL bracket has gib key. Type ALO has no gib key. See position 69 on page 56.

Motorized Pulley 500H, Ø 19.72 in. (501 mm) 60 Hz

(Design based on former TM500 / TM501)

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5]									Type of Bracket
Power HP	No. of Poles								29.53	31.50	33.46	35.43	37.40	39.37	41.34	43.31	45.28	longer than 45.28	
7.5	8	2	500H	120* 150* 192	126 161 211	1839 1442 1097	10,340	29.53	775	797	819	839	861	878	897	916	936	See Foot-note[4]	AL65& ALO65
	6	2	500H	240 300 384 480 600	281 313 390 476 626	823 739 592 486 369													
10	8	2	500H	120* 150 192	126 161 211	2509 1966 1496			797	819	841	861	883	898	917	936	956		
	6	2	500H	240 300 384 480 600	281 313 390 476 626	1122 1007 807 662 504													
15	6	2	500H	192 240 300 384 480 600	214 281 313 390 476 626	2163 1645 1477 1185 970 739			819	841	863	883	905	920	939	958	978		
20	4	2	500H	240* 300 384 480 600 760	251 321 421 469 585 715	2509 1966 1496 1343 1077 882			844	863	881	900	918	940	959	978	999		
25	4	2	500H	300 384 480 600 760	321 421 469 585 715	2425 1845 1656 1328 1089			866	885	903	922	940	962	981	1000	1020		
30	4	2	500H	300 384	321 421	2877 2210		33.46	-	-	903	922	940	959	978	997	1017		
	2			480* 600* 760	502 642 843	1839 1442 1097		29.53	866	885									
40	4	2	500H	384 480 600 760	421 469 585 715	2925 2626 2105 1722		33.46	-	-	1090	1109	1127	1146	1165	1184	1204		
											Standard RL →								
Idler Pulley				Model UT500H			10,340	23.62	495	515	537	556	578	600	619	638	658	See Foot-note[4]	AL65 & ALO65

1 Use "nominal belt speed" to specify pulley. "Actual belt speed" is presented (for pulley lagged with 3/8" thick material) to assist with process design calculations. See Technical Precautions page 79. Note that "actual belt speed" decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding "Maximum radial load" defined above. See "Belt Tension" section in Technical Precautions, page 80.

4 Additional Motorized Pulley and Idler weight, specified per Roller Length: 45.28"≤ RL ≤ 78.74" Wt = 9.8 lbs/in.

5 All weights shown above include mounting brackets and are for pulleys "fully lagged" with 3/8" thick material (i.e. rubber for 7.5 - 30 HP and solid ceramic for 40 HP). For "partially lagged" pulleys add 6% to 10% to the weights shown above. See page 47, 82, & 83 for "partial lagging." To calculate unlagged pulley weight subtract 0.9 lbs/in of Roller Length from above.

* External brake shaft option is not available in these belt speeds.

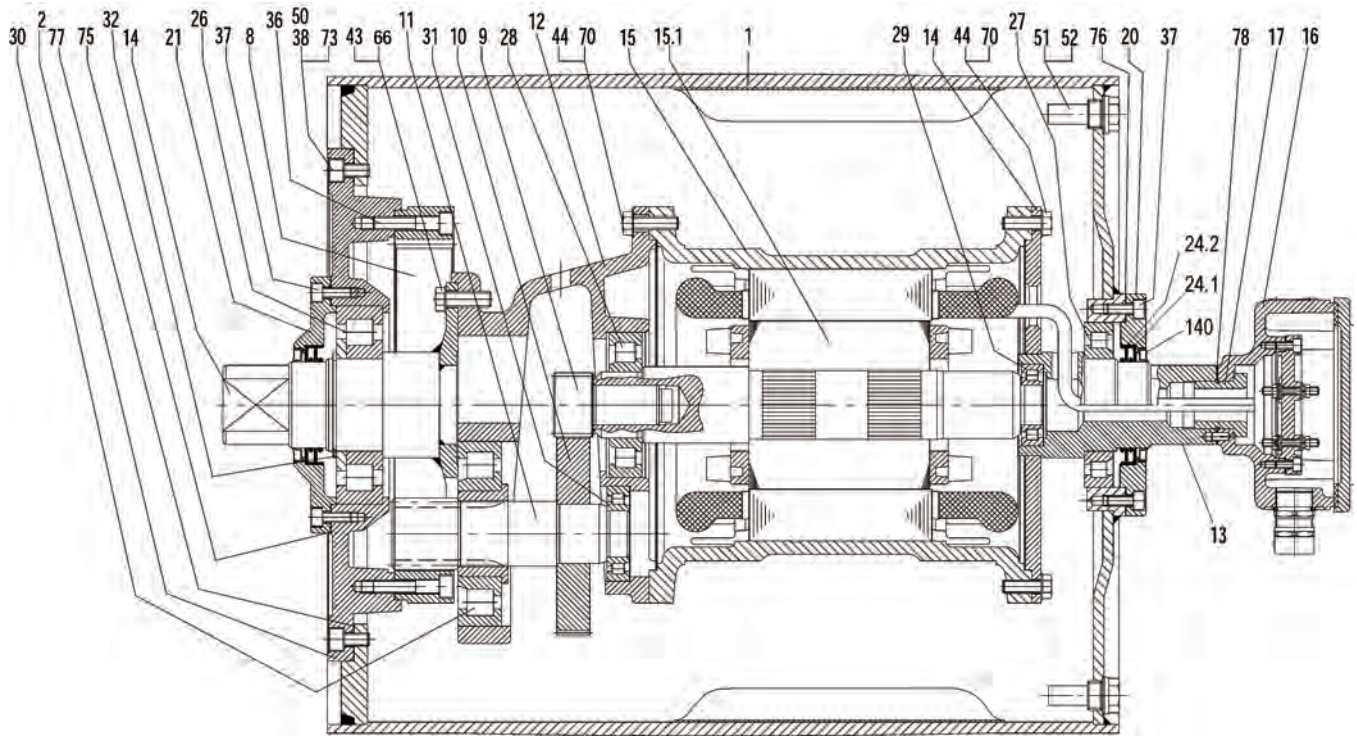
Motorized Pulley 500L, Ø 19.72 in. (501 mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
2	End housing with geared rim
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box ñ cast aluminum
13	Front shaft
13.1	Front shaft (ss option)
14	Rear shaft
14.1	Rear shaft (ss option)
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
20	Cover ñ front side
20.1	Cover with labyrinth groove
21	Cover ñ rear side
21.1	Cover with labyrinth groove
23	Rear flange
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal outer (lab option)
24.4	Shaft oil seal inner (lab option)
26	Bearing

Pos.	Description
27	Bearing
28	Bearing
29	Bearing
30	Bearing
31	Bearing
32	Retaining ring
36	Hexagon socket screw
37	Hexagon socket screw
38	Hexagon socket screw
43	Hexagon screw
44	Hexagon screw
45	Hexagon screw
50	Waved spring washer
51	Gasket
52	Magnetic oil plug
53	Distance washer
66	Waved spring washer
67	Waved spring washer
70	Waved spring washer
73	Set screw
75	Gasket
76	Gasket
77	Gasket
78	Gasket
85	Intermediate flange

Pos.	Description
90	Backstop
91	Electromagnetic brake
93	Retaining ring
94	Hexagon head screw
99	Waved spring washer
101	Key
104	Distance washer
120	Labyrinth cover
121	Fixing bolt
122	O-ring
123	Grease nipple
140	Deflection seal (future)
180	Intermediate pinion shaft
181	Intermediate pinion
182	Distance washer
183	Distance washer
184	Roller bearing
185	Roller bearing
186	Key
187	Key
188	Retaining ring
190	Retaining ring
191	Retaining ring
194	Set screw
196	Key
197	Retaining ring



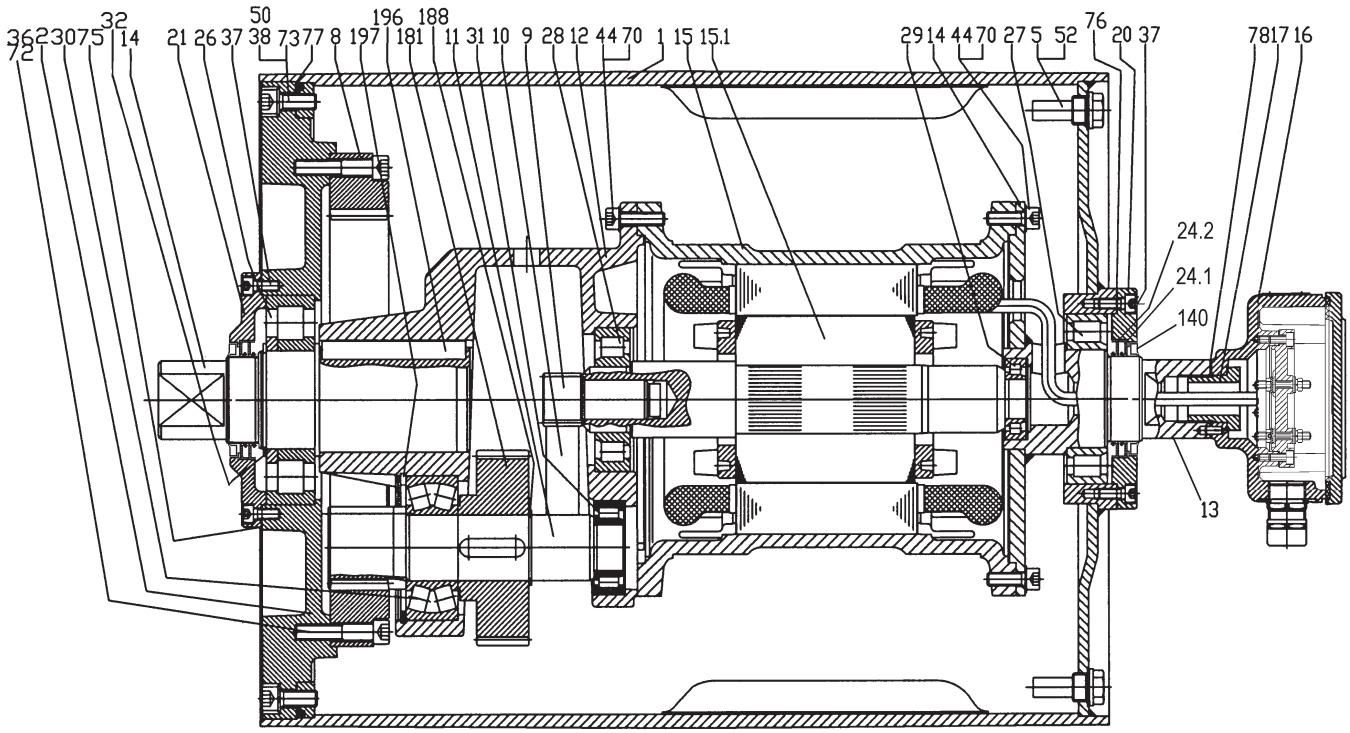
Motorized Pulley 500M, Ø 19.72 in. (501 mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
2	End housing with geared rim
3	End housing
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box ñ cast iron
13	Front shaft
13.1	Front shaft (ss option)
14	Rear shaft
14.1	Rear shaft (ss option)
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
20	Cover ñ front side
20.1	Cover with labyrinth groove
21	Cover ñ rear side
21.1	Cover with labyrinth groove
23	Rear flange
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal outer (lab option)
24.4	Shaft oil seal inner (lab option)

Pos.	Description
26	Bearing
27	Bearing
28	Bearing
29	Bearing
30	Bearing
31	Bearing
32	Retaining ring
36	Hexagon socket screw
37	Hexagon socket screw
38	Hexagon socket screw
43	Hexagon head screw
44	Hexagon head screw
45	Hexagon head screw
50	Waved spring washer
51	Gasket
52	Magnetic oil plug
53	Distance washer
66	Waved spring washer
70	Waved spring washer
73	Set screw
75	Gasket
76	Gasket
77	Gasket
78	Gasket
85	Intermediate flange

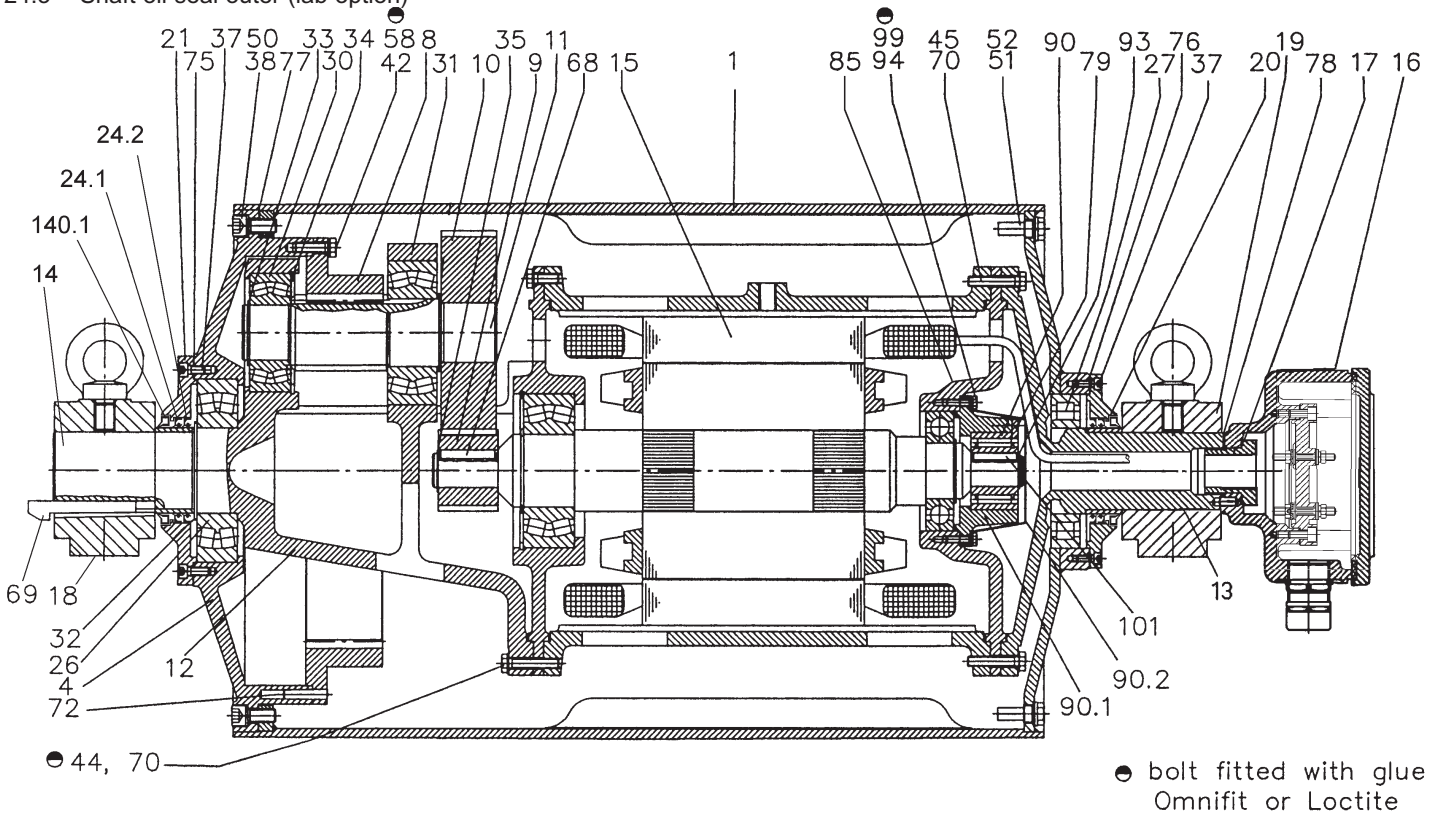
Pos.	Description
90	Backstop
91	Electromagnetic brake
93	Retaining ring
94	Hexagon head screw
99	Waved spring washer
100	Key
104	Distance washer
120	Labyrinth cover
121	Fixing bolt
122	O-ring
123	Grease nipple
140	Deflection seal (future)
180	Intermediate pinion shaft
181	Intermediate pinion
182	Distance washer
183	Distance washer
184	Roller bearing
185	Roller bearing
186	Key
187	Key
188	Retaining ring
191	Retaining ring
194	Set screw
196	Key
197	Retaining ring



Motorized Pulley 500H, Ø 19.72 in. (501 mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
4	End housing with geared rim
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box including rear shaft
13	Front shaft
14	Rear shaft
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
18	Mounting brackets rear side
18.1	Mounting bracket w/lab rear side
19	Mounting bracket front side
19.1	Mounting brackets w/lab front side
20	Cover ñ front side
20.1	Cover with labyrinth groove
21	Cover ñ rear side
22.1	Cover with labyrinth groove
23	Rear flange
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal outer (lab option)
24.4	Shaft oil seal inner (lab option)
26	Bearing
27	Bearing
30	Bearing
31	Bearing
32	Retaining ring
33	Retaining ring
34	Retaining ring
35	Retaining ring
37	Hexagon socket screw
38	Hexagon socket screw
42	Hexagon head screw
44	Hexagon head screw
45	Hexagon head screw
50	Washer
51	Gasket
52	Magnetic oil plug
58	Spring washer
68	Key
69	Gib key
70	Waved spring washer
72	Grooved pin
73	Set screw
75	Gasket
76	Gasket
77	Gasket
78	Gasket
79	Holding plate
85	Motor flange for backstop/brake
90	Backstop
90.1	Backstop housing
90.2	Backstop cover
93	Backstop retaining ring
94	Backstop hex head screw
99	Backstop spring washer
101	Backstop key
123	Grease nipple
130	Brake shaft
131	Mounting bracket bearing cover
132	Roller bearing
133	Brake shaft seal
134	Brake shaft seal
135	Retaining ring
136	Bolts - bearing cover
137	Spring lock washer
138	Key
139	Retaining ring
140	Key
140.1	Deflection seal (future)

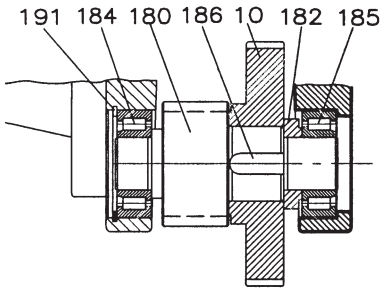


Cross sectional drawing shows optional backstop.

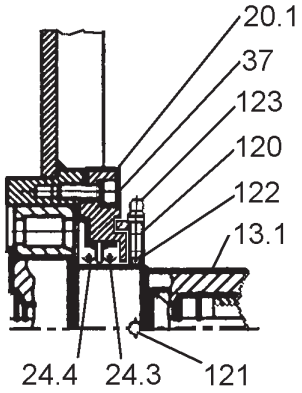
Motorized Pulley 500L & 500M, Ø 19.72 in. (501 mm)

Sectional drawings (See parts list on pages 54 & 55.)

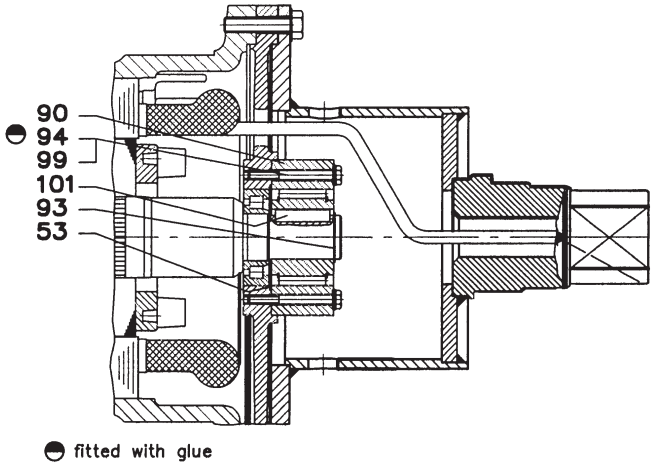
Intermediate Shaft (valid for 500M)



Labyrinth Option

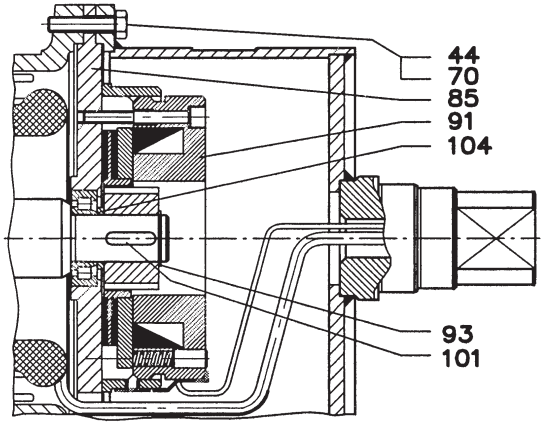


Backstop Option



◓ fitted with glue

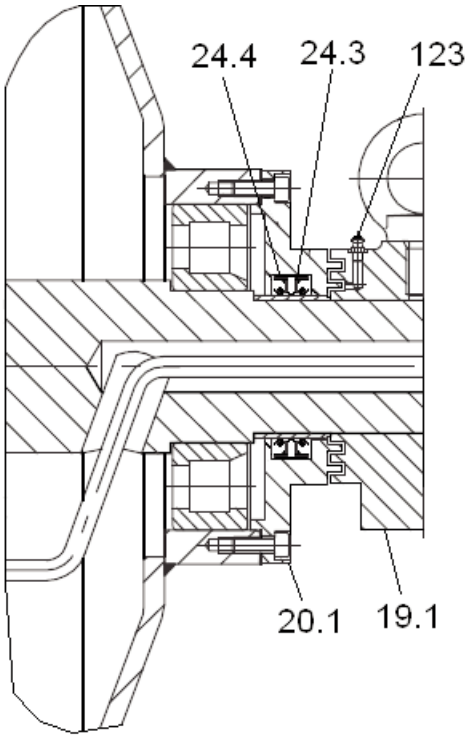
Electromagnetic Brake Option



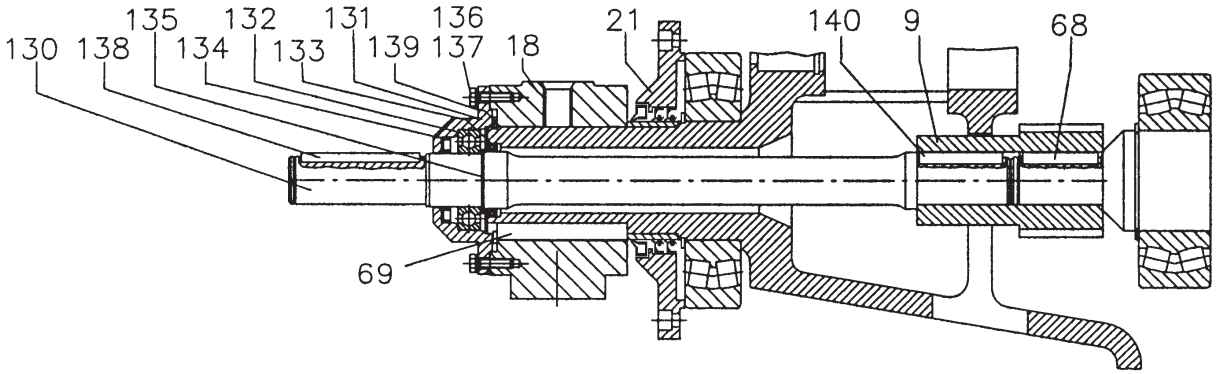
Motorized Pulley 500H, Ø19.72 in. (501 mm)

Sectional drawings (See parts list on page 56.)

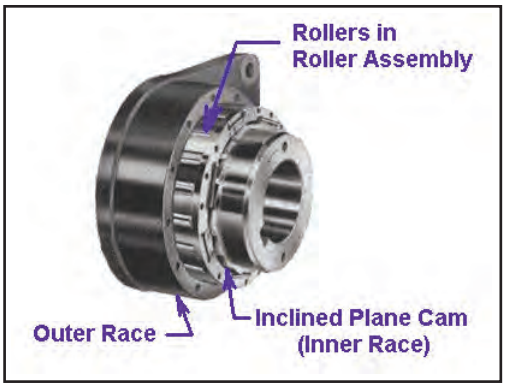
Labyrinth Seal Option



External Brake Shaft Option

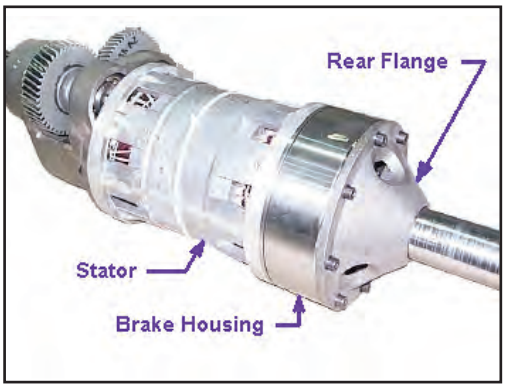


Motorized Pulley Options
Mechanical Backstops and Brakes



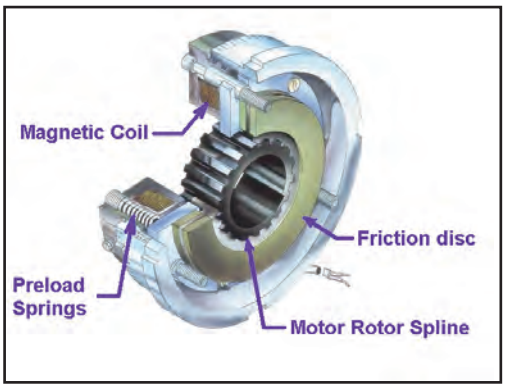
Mechanical Backstop Exploded View
Rulmeca's mechanical backstops are built into the Motorized Pulley to limit pulley rotation to one direction (either clockwise or counterclockwise.) The backstop's keyed inner race is fixed to the motor rotor and the outer race is bolted to the motor stator frame. This yields two advantages: (1.) the backstop has all of the mechanical advantage, which can be as high as 100:1, and (2.) it is protected in a hermetically sealed environment.

Technical Precaution: It is essential that the identity of each of the three phases of the power supply be determined before attaching power supply wires to the pulley to prevent the motor from driving against the backstop. The identity of each of the three phases of the motor is clearly labeled.



Rulmeca Internal Brake/Motor/Gearbox Assembly
Spring-loaded electromagnetic brakes are designed to release when power is applied to the brake coil. This is a "fail safe" feature. They clamp shut when brake power is removed (either during normal operation or during an emergency loss of overall system power.) Photo shows 320H model. Note that this option requires additional internal space and larger minimum Roller Length.

Technical Precaution: Control circuit for motor and brake must be designed to stop pulley motor before brake clamps shut and start pulley motor after brake is released. Brakes are DC-powered and supplied with AC to DC rectifiers to be mounted in a remote panel (by others). Control circuit must be designed to kill motor power in the event of loss of brake power. If this provision is not made, motor can possibly "power through" clamped brake.



Rulmeca Internal Brake
Rulmeca internal brake is designed to function primarily as a belt holding device for reversing and/or articulating conveyors. The brake is not intended to be a conveyor stopping device. The brake's keyed spline is fixed to the motor rotor and the brake's housing is bolted to the motor stator frame. This yields two advantages: (1.) the brake has all of the mechanical advantage, which can be as high as 100:1, and (2.) it is protected in a hermetically sealed environment.

Technical Precaution: Control circuit must be designed so that motor and brake never work against each other. Brake should never be clamped shut when motor is on except for "emergency stop." Motor should never be powered on (including "jog" command) when the brake is clamped shut.

Example of External Brake (South Carolina—USA)
Available in models 500H and larger, Rulmeca external brake shaft option extends motor rotor shaft through hole in non-rotating pulley shaft for attachment of external brake (by others.) This hydraulically-actuated double-shoe brake (protective cover removed for photograph) prevents conveyor roll back when fully loaded belt is stopped.

The external brake option provides one of the two key advantages available with the internal brake option. Brake has all of the mechanical advantage of the drive (as high as 100:1 ratio) because it is fixed directly to the motor rotor shaft. It is, however, exposed to the environment.

Motorized Pulley 630M & 630H, Ø 24.80 in. (630 mm)

Our 24.80" diameter Motorized Pulley range offers two different performance levels for BULK applications:

- M for Medium duty
- H for Heavy duty

It is important to note the product differences and choose the appropriate pulley based on estimated belt tension (radial load.) See page 80. The actual radial load must be less than the maximum allowable radial load shown in this catalog.

Be aware of increased belt tensions required to drive multi-ply thick heavy belts and/or larger belt widths.

If the 24.80" diameter model is not strong enough to resist estimated belt tension, then select 31.50" diameter model.

M for Medium duty

A solid 2-stage gearbox enables the 630M to handle irregular loadings in harsh operating conditions. 630M uses motor and gearbox from 500H. Note that 630M outer dimensions do not match 630H

H for Heavy duty

630H has stronger internal components with gearbox, shaft, and bearings designed for tough, irregular, and extreme operating conditions.

STANDARD SPECIFICATION of Motorized Pulley

- Crowned mild steel 24.80" diameter steel shell painted yellow at a minimum thickness of 2.4 mils
- Bolted powder coated cast iron bearing housings and covers, all painted yellow at a minimum thickness of 2.4 mils
- Mild steel shafts with nitrided shaft sleeves.
- Shaft sealing system - degree of protection IP66/67 (EN60034-5.) See page 37.
- Cast iron terminal box for painted yellow at min.thickness of 2.4 mils
- 3-phase induction motors with thermal protector
- Voltage: All common voltages available. Please specify.
- Motor winding insulation Class H
- Dynamically balanced rotor
- Two oil plugs each fitted with a magnet to filter the oil
- Yellow painted mounting brackets (AL & ALO) included with pulley
- Oil change recommended every 50,000 operational hours for synthetic oil (or 20,000 operational hours for mineral oil.)
- Minimum RL. Refer to pages 63
- Maximum RL - Please inquire
- Non standard RL's available
- To be used in horizontal positions ±5 degree only

Please note:

- **Noise-sensitive Areas:** High speed 2-pole motors can cause higher noise levels and are not recommended for noise-sensitive areas
- **Technical Precautions for Design, Installation, and Maintenance:** pages 78-98
- **Environmental Considerations:** page 76-77
- **Optional Extras:** page 61 and back cover
- **Electrical Connection Diagrams:** pages 92-98.

SEMI-RUST-FREE options

TS11

- Painted mild steel shell at minimum thickness of 4.7 mils
- Painted cast iron end housings at minimum thickness of 4.7 mils
- Stainless steel bearing covers with labyrinth grooves - AISI 304 range
- Nitrided shaft sleeves
- Zinc-plated oil plugs - each with magnet
- Zinc-plated exterior bolts
- Shaft sealing system - degree of protection P66/67 (EN60034-5) See pg 37.
- Painted terminal box at minimum thickness of 4.7 mils
- Nickel plated mounting brackets with labyrinth grooves

TS12

- As TS11, but without regreasable seals.
- Covers - standard

Please note:

- FDA & USDA food grade recognized oil and grease are not included in TS11 & TS12, but available on request.

Please specify required TS number when ordering Stainless Steel options.

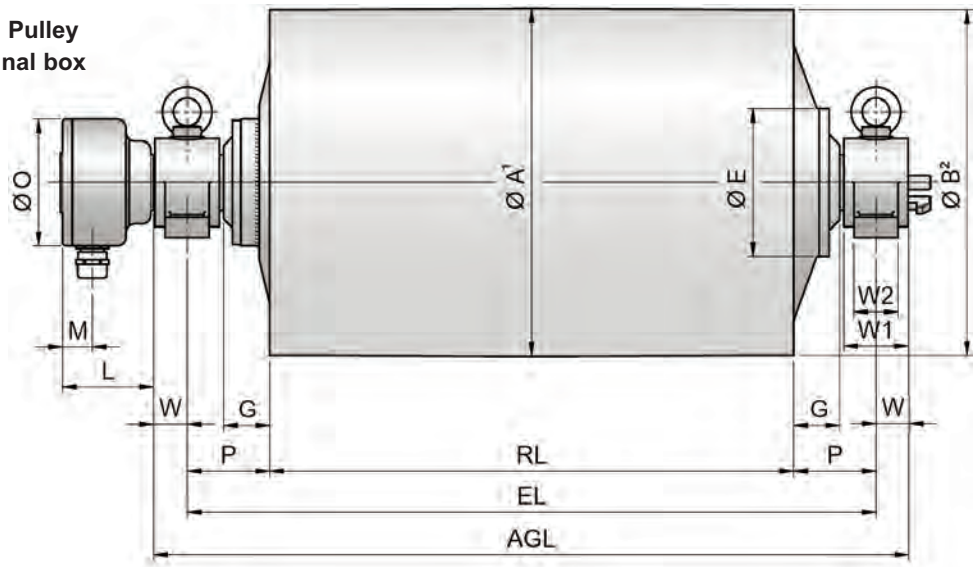
OPTIONAL EXTRAS
Motorized Pulley 630M & 630H

Specification		Availability
Semi-rust-free option	TS11 with regreasable labyrinth seals	x
Semi-rust-free option	TS12 with standard seals	x
Regreasable labyrinth seals		x
Dust explosion proof Motorized Pulleys - ATEX 95 - Zone 22 - for applications handling of dusty grain etc. According to European Directive 94/9/EC.		o
Standard black rubber lagging (See pages 82-83.)		
3/8” full smooth lagging - Hardness 60 ±5 Shore A		o
3/8” full diamond lagging - Hardness 60 ±5 Shore A		o
3/8” partial smooth lagging - Hardness 60 ±5 Shore A		o
Special lagging - e.g. hot vulcanized, partial, and ceramic (See pages 82-83.)		o
External brake shaft (for mechanical brake by others)		x
Mechanical backstop	Min. RL = 29.53î for 630M	x
	Min. RL = 37.40î for 630H	x
Insulation class F with standard oil: (allowable ambient temperature: -13 F/+104 F)		x
Insulation class H with synthetic oil: (allowable ambient temperature: -13 F/+120 F)		Std.
Parallel shell		x
Thermal protector		Std.
Voltage: Single voltage (460) stator (Y winding) wired for 460v/3ph/60 Hz at terminal box		Std.
IP66/67 Standard yellow powder coated cast iron terminal box		Std.
Special voltage motors		x
CSA approved motors		x

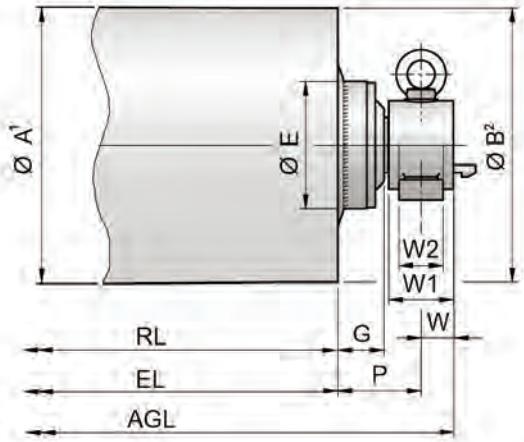
x = Optional extras
o = An option with certain limitations. Please refer to Technical precautions pages 78-98!
Std. = Fitted as standard

Motorized Pulley 630M & 630H, Ø 24.80 in. (630 mm)

Motorized Pulley with terminal box

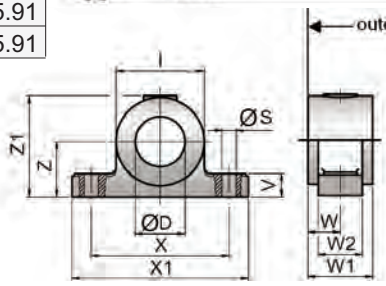


Idler Pulley³ UT500H / UT502H



Model	Motorized Pulleys or Idler Pulleys A in	B in	C in	D⁴ in	E in	G in	L in	M in	O in	P in
630M	24.80	24.65	-	2.56	7.56	3.74	3.94	1.42	6.14	5.91
630H	24.80	24.65	-	3.54	10.55	3.46	6.50	2.13	9.06	5.91
UT500H	19.72	19.72	-	2.56	9.25	3.74	-	-	-	5.91
UT502H	19.72	19.72	-	3.54	8.90	3.35	-	-	-	5.91

1 A dimension is outer diameter of unlagged pulley shell at pulley centerline.
2 B dimension is outer diameter of unlagged pulley shell at each end of shell.
3 Idler pulley shown is non-crowned version.
4 D dimension is shaft diameter.



Mounting brackets*

Motorized Pulleys & Idler Pulleys Model	Material	Bracket Size*	Dimensions D in	I in	S in	V in	W in	W1 in	W2 in	X in	X1 in	Z in	Z1 in	Weight lbs
630M & UT500H	Cast iron	AL65 / ALO65	2.56	4.53	0.91	1.34	1.85	3.54	2.36	7.09	9.45	3.15	5.55	17.64
630H & UT502H	Cast steel	AL90 / ALO90	3.54	6.30	1.02	1.65	2.40	4.61	3.15	9.84	12.60	3.94	7.20	41.89

* Type AL bracket has gib key. Type ALO has no gib key. See position 69 on page 64.

Motorized Pulley 630M & 630H, Ø 24.80 in. (630 mm) 60 Hz

Motor Power HP	Motor No. of Poles	No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5] 29.53	31.50	33.46	35.43	37.40	39.37	41.34	43.31	45.28	longer than 45.28	Type of Bracket
7.5	8	2	630M	150 192 240	157 200 267	1473 1155 866	10,300	29.53										See Note[4]	AL65 & ALO65
	6	2	630M	300 384 480 600 760	351 390 487 594 782	659 591 475 388 296			907	929	951	972	994	1019	1041	1064	1086		
10	8	2	630M	150 192 240	157 200 267	2009 1574 1181													
	6	2	630M	300 384 480 600 760	351 390 487 594 782	899 807 647 530 404			927	949	970	992	1014	1039	1061	1084	1106		
15	6	2	630M	240 300 384 480 600 760	267 351 390 487 594 782	1733 1318 1183 949 777 591			960	982	1006	1027	1049	1074	1096	1119	1141		
20	4	2	630M	300 384 480 600 760	313 401 526 586 730	2003 1574 1199 1075 863			984	1006	1030	1052	1074	1099	1120	1143	1165		
25	4	2	630M	384 480 600 760	400 526 586 730	1959 1478 1327 1064			1006	1028	1052	1074	1096	1121	1142	1165	1187		
30	2	2	630M	600 760	627 800	1473 1155			1006	1028	1052	1074	1096	1121	1142	1165	1187		

Standard RL ➔

Motor Power HP	Motor No. of Poles	No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5] 37.40	39.37	41.34	43.31	45.28	47.24	49.21	51.18	longer than 51.18	Type of Bracket
30	8	2	630H	240 300 384 480 600 760	247 314 408 492 639 783	3745 2946 2268 1879 1449 1182	16,600	37.40	1819	1850	1879	1910	1939	1963	1995	2025	See Note[4]	AL90 & ALO90
40	8	2	630H	240 300 384 480 600 760	247 314 408 492 639 783	5107 4018 3093 2563 1975 1611	22,000	37.40	1863	1894	1923	1955	1983	2007	2039	2069		
50	6	2	630H	300 384 480 600 760	330 418 544 656 851	4723 3717 2861 2370 1828	22,000	37.40	1863	1894	1923	1955	1983	2007	2039	2069		
61	4	2	630H	480 600 760 960	493 627 815 984	3830 3013 2321 1922	19,900	37.40	1907	1939	1967	1999	2027	2051	2083	2114		
75	4	2	630H	600 760 960	627 815 984	3683 2836 2349	19,900	37.40	1907	1919	1967	1999	2027	2051	2083	2114		

Standard RL ➔

Idler Pulley															
	Model UT500H	10,300	29.53	578	600	638	658	677	697	716	735	See Note[4]	AL65 & ALO65
	Model UT502H	22,000	29.53	669	691	711	733	753	775	797	818		

1 Use "nominal belt speed" to specify pulley. "Actual belt speed" is presented (for pulley lagged with 3/8" thick rubber) to assist with process design calculations. See Technical Precautions page 79. Note that "actual belt speed" decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding "Maximum radial load" defined above. See "Belt Tension" section in Technical Precautions, page 80.

4 Additional Motorized Pulley and Idler weight: Model 630M: 45.28"≤ RL ≤ 78.74" Wt = 11.2 lbs/in; Model 630H: 51.18"≤ RL ≤ 78.74" Wt = 15.8 lbs/in.

5 All weights shown above include mounting brackets and are for pulleys "fully lagged" with 3/8" thick rubber. For model 630H "partially lagged" pulleys add 4% to 7% to the weights shown above. See pages 47, 82 and 83 for "partial lagging." To calculate unlagged pulley weight subtract 1.2 lbs/in of Roller Length from above.

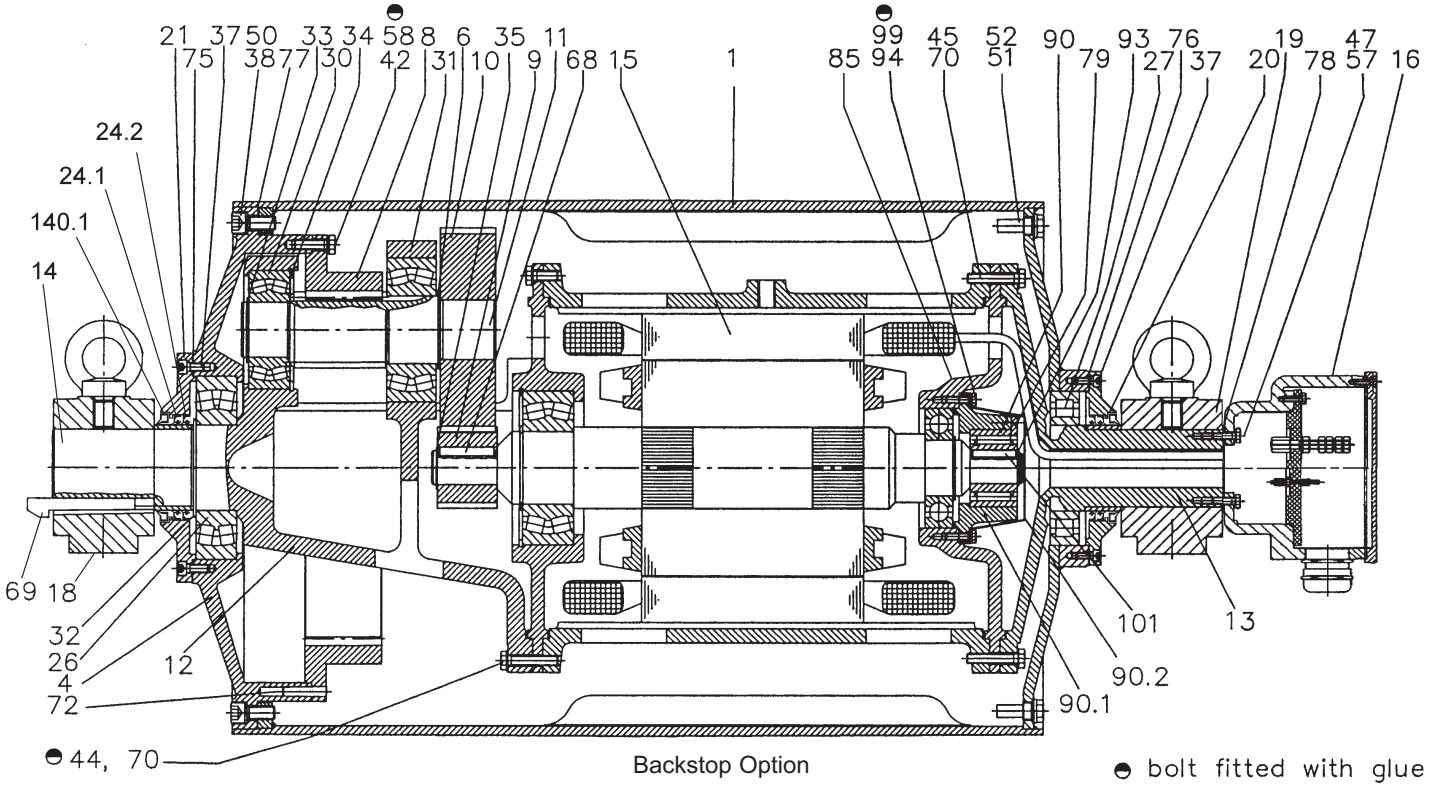
Motorized Pulley 630M & 630H, Ø 24.80 in. (630 mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
4	End housing with geared rim
6	Distance washer (630H)
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box including rear shaft
13	Front shaft
14	Rear shaft
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple (630M only)
18	Mounting bracket rear side
18.1	Mtg bracket rear side (lab option)
19	Mounting bracket front side
19.1	Mtg bracket front side (lab option)
20	Cover ñ front side
20.1	Cover with labyrinth groove
21	Cover ñ rear side
21.1	Cover with labyrinth groove
23	Rear flange
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal outer (lab option)

Pos.	Description
24.4	Shaft oil seal inner (lab option)
26	Bearing
27	Bearing
30	Bearing
31	Bearing
32	Retaining ring
33	Retaining ring
34	Retaining ring
35	Retaining ring
37	Hexagon socket screw
38	Hexagon socket screw
42	Hexagon head screw
44	Hexagon head screw
45	Hexagon head screw
47	Hexagon head screw
50	Washer
51	Gasket
52	Magnetic oil plug
57	Washer
58	Spring washer
68	Key
69	Gib key
70	Waved spring washer
72	Grooved pin
73	Set screw
75	Gasket

Pos.	Description
76	Gasket
77	Gasket
78	Gasket
79	Holding plate
85	Motor flange for backstop/brake
90	Backstop
90.1	Backstop housing
90.2	Backstop cover
93	Retaining ring
94	Hexagon head screw
99	Spring washer
101	Key
123	Grease nipple
130	Brake shaft
131	Mounting bracket bearing cover
132	Roller bearing
133	Brake shaft seal
134	Brake shaft seal
135	Retaining ring
136	Bolts - bearing cover
137	Spring lock washer
138	Key
139	Retaining ring
140	Key
140.1	Deflection seal (future)



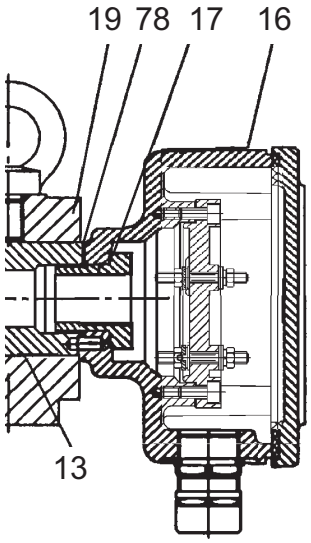
Backstop Option

● bolt fitted with glue Omnifit or Loctite

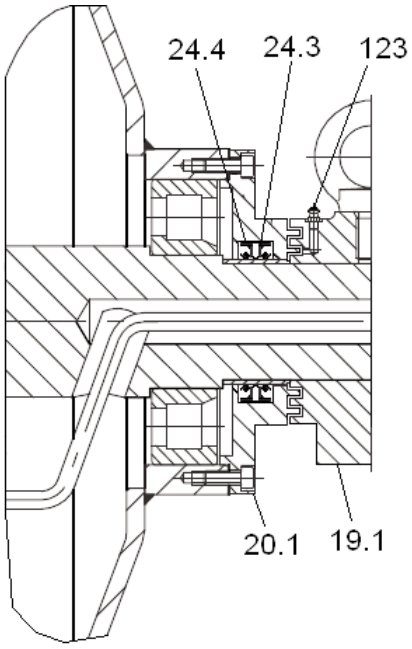
Motorized Pulley 630M & 630H, Ø 24.80 in. (630 mm)

Sectional drawings

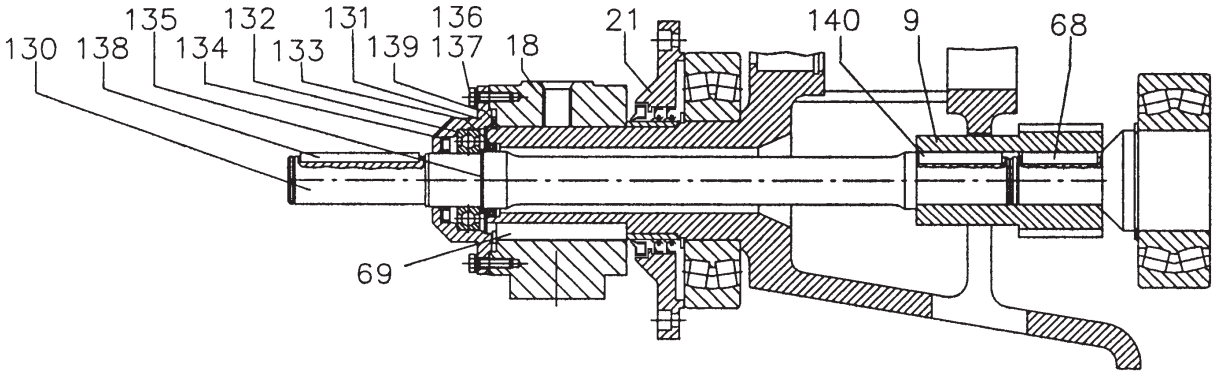
Terminal Box
(valid for 630M)



Labyrinth Seal Option



External Brake Shaft Option



Motorized Pulley 800M, 800H, & 800HD Ø 31.50 in. (800 mm)

Our 31.50" diameter Motorized Pulley range offers two different performance levels for BULK applications:

- M for Medium duty
- H for Heavy duty

It is important to note the product differences and choose the appropriate pulley based on estimated belt tension (radial load.) See page 80. The actual radial load must be less than the maximum allowable radial load shown in this catalog.

Be aware of increased belt tensions required to drive multi-ply thick heavy belts and/or larger belt widths.

If the 800M is not strong enough to resist estimated belt tension, then select 800H.

M for Medium duty

A solid 2-stage gearbox enables the 800M to handle irregular loadings in harsh operating conditions. 800M uses motor and gearbox from 630H. Note that 800M outer dimensions do not match 800H

H for Heavy duty

800H has stronger internal components with gearbox, shaft, and bearings designed for tough, irregular, and extreme operating conditions.

STANDARD SPECIFICATION of Motorized Pulley

- Crowned mild steel 31.50" diameter steel shell painted yellow at a minimum thickness of 2.4 mils
- Bolted powder coated cast iron bearing housings and covers, all painted yellow at a minimum thickness of 2.4 mils
- Mild steel shafts with nitrided shaft sleeves.
- Shaft sealing system - degree of protection IP66/67 (EN60034-5.) See page 37.
- Cast iron terminal box for painted yellow at min. thickness of 2.4 mils
- 3-phase induction motors with thermal protector
- Voltage: All common voltages available. Please specify.
- Motor winding insulation Class H
- Dynamically balanced rotor
- Two oil plugs each fitted with a magnet to filter the oil
- Yellow painted mounting brackets (AL & ALO) included with pulley
- Oil change recommended every 50,000 operational hours for synthetic oil (or 20,000 operational hours for mineral oil.)
- Minimum RL. Refer to pages 69
- Maximum RL - Please inquire
- Non standard RL's available
- To be used in horizontal positions ±5 degree only

Please note:

- **Noise-sensitive Areas:** High speed 2-pole motors can cause higher noise levels and are not recommended for noise-sensitive areas
- **Technical Precautions for Design, Installation, and Maintenance:** pages 78-98
- **Environmental Considerations:** page 76-77
- **Optional Extras:** page 67 and back cover
- **Electrical Connection Diagrams:** pages 92-98.

SEMI-RUST-FREE options

TS11

- Painted mild steel shell at minimum thickness of 4.7 mils
- Painted cast iron end housings at minimum thickness of 4.7 mils
- Stainless steel bearing covers with labyrinth grooves - AISI 304 range
- Nitrided shaft sleeves
- Zinc-plated oil plugs - each with magnet
- Zinc-plated exterior bolts
- Shaft sealing system - degree of protection P66/67 (EN60034-5) See pg 37.
- Painted terminal box at minimum thickness of 4.7 mils
- Nickel plated mounting brackets with labyrinth grooves

TS12

- As TS11, but without regreasable seals.
- Covers - standard

Please note:

- FDA & USDA food grade recognized oil and grease are not included in TS11 & TS12, but available on request.

Please specify required TS number when ordering Stainless Steel options.

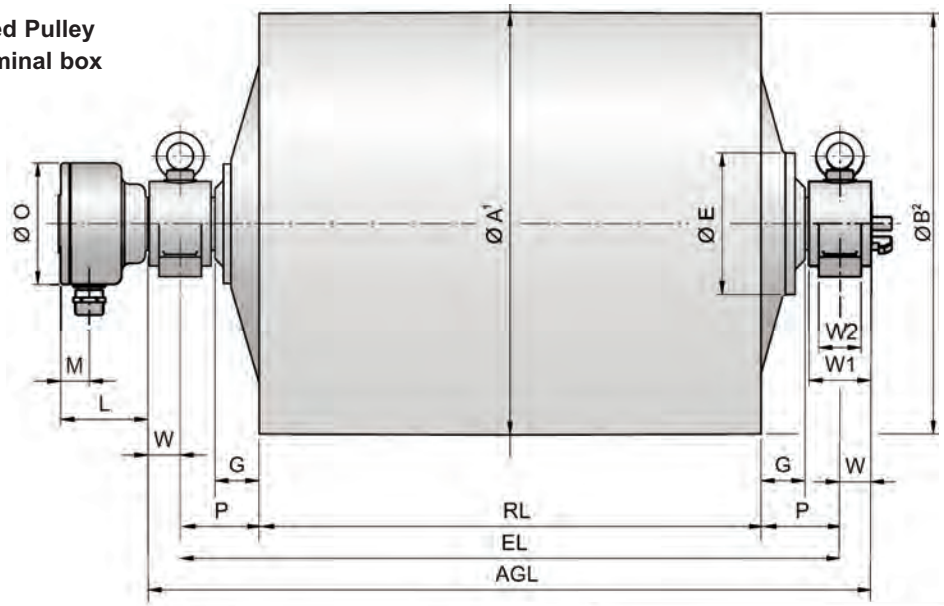
OPTIONAL EXTRAS
Motorized Pulley 800M, 800H, & 800HD

Specification		Availability
Semi-rust-free option	TS11 with regreasable labyrinth seals	x
Semi-rust-free option	TS12 with standard seals	x
Regreasable labyrinth seals		x
Dust explosion proof Motorized Pulleys - ATEX 95 - Zone 22 - for applications handling of dusty grain etc. According to European Directive 94/9/EC.		x
Standard black rubber lagging (See pages 82-83.)		
3/8î full smooth lagging -	Hardness 60 ±5 Shore A	o
3/8î full diamond lagging -	Hardness 60 ±5 Shore A	o
3/8î partial smooth lagging -	Hardness 60 ±5 Shore A	o
Special lagging - e.g. hot vulcanized, partial, and ceramic (See pages 82-83.)		o
External brake shaft (for mechanical brake by others)		x
Mechanical backstop	Min. RL = 37.40î for 800M	x
	Min. RL = 45.28î for 800H ≤ 100 HP	x
	Min. RL = 55.12î for 800H > 100 HP	x
Insulation class F with standard oil: (allowable ambient temperature: -13 F/+104 F)		x
Insulation class H with synthetic oil: (allowable ambient temperature: -13 F/+120 F)		Std.
Parallel shell		x
Thermal protector		Std.
Voltage: Single voltage (460) stator (Y winding) wired for 460v/3ph/60 Hz at terminal box		Std.
IP66/67 Standard yellow powder coated cast iron terminal box		Std.
Special voltage motors		x
CSA approved motors		x

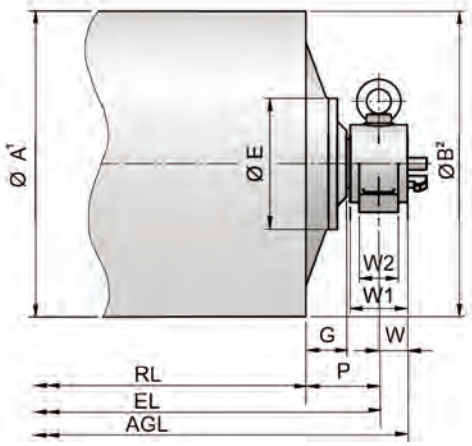
x = Optional extras
o = An option with certain limitations. Please refer to Technical precautions pages 78-98.
Std. = Fitted as standard

Motorized Pulley 800M, 800H, & 800HD Ø 31.50 in. (800 mm)

Motorized Pulley with terminal box



Idler Pulley[3] UT630M / UT630H



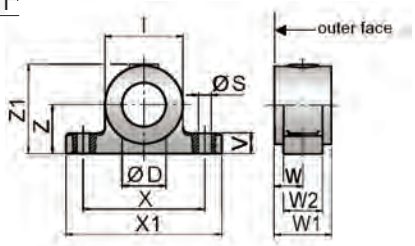
Model	Motorized Pulleys or Idler Pulleys A in	B in	C in	D[4] in	E in	G in	L in	M in	O in	P in
800M	31.50	31.34	-	3.54	10.55	3.46	6.50	2.13	9.06	5.91
800H	31.50	31.34	-	4.72	12.99	3.15	7.87	2.44	10.24	5.91
UT630M	24.80	24.80	-	3.54	8.90	3.35	-	-	-	5.91
UT630H	24.80	24.80	-	4.72	12.99	2.95	-	-	-	5.91

1 A dimension is outer diameter of unlagged pulley shell at pulley centerline.

2 B dimension is outer diameter of unlagged pulley shell at each end of shell.

3 Idler pulley shown is non-crowned version.

4 D dimension is shaft diameter.



Mounting brackets*

Motorized Pulleys & Idler Pulleys Model	Material	Bracket Size*	Dimensions D in	I in	S in	V in	W in	W1 in	W2 in	X in	X1 in	Z in	Z1 in	Weight lbs
800M & UT630M	Cast steel	AL90/ALO90	3.54	6.30	1.02	1.65	2.40	4.61	3.15	9.84	12.60	3.94	7.20	41.89
800H & UT630H	Cast steel	AL120/ALO120	4.72	7.87	1.30	1.97	3.74	6.30	4.72	11.81	14.57	4.33	8.39	83.78

* Type AL bracket has gib key. Type ALO has no gib key. See position 69 on page 70.

Motorized Pulley 800M, 800H, & 800HD, Ø 31.50 in. (800 mm) 60 Hz

Motor Power HP	Motor No. of Poles	No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5] 37.40	39.37	41.34	43.31	45.28	47.24	49.21	51.18	53.15	longer than 53.15	Type of Bracket
30	8	2	800M	300 384 480 600 760	312 396 515 621 806	2966 2333 1797 1489 1148	16,500	37.40	2118	2150	2179	2211	2241	2266	2291	2323	2354	See Note[4]	AL90 & ALO90
40	8	2	800M	300 384 480 600 760	312 396 515 621 806	4045 3182 2451 2030 1565	22,000	37.40	2207	2239	2268	2300	2329	2354	2379	2411	2443		
50	6	2	800M	384 480 600 760 960	416 528 686 828 1075	3741 2944 2267 1877 1448	22,000	37.40	2207	2239	2268	2300	2329	2354	2379	2411	2443		
61	4	2	800M	600 760 960	614 786 983	3034 2386 1838	19,900	37.40	2251	2282	2312	2343	2373	2398	2423	2455	2486		

Standard RL ➔

Motor Power HP	Motor No. of Poles	No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimen. inches (RL>78.74" avail. on request) Weight in lbs[5] 55.12	57.09	59.06	61.02	62.99	64.96	66.93	68.90	70.87	longer than 70.87	Type of Bracket
75	8	3	800HD	240	248	9331	74,000	51.18	5323	5381	5439	5497	5555	5614	5672	5730	5788	See Note[4]	AL90 & ALO90
	6			300	330	7013													
	8	2	800H	384	380	6087	45,000	55.12	4823	4881	4939	4997	5055	5114	5172	5230	5288		
	6			480 600 760 960 1064	507 617 740 879 1036	4565 3749 3124 2630 2231		45.28											
100	8	3	800HD	240	248	12442	74,000	61.02	-	-	-	5497	5555	5614	5672	5730	5788		
	6			300	330	9350		51.18	5323	5181	5439								
	8	2	800H	384	380	8300	45,000	55.12	4823	4881	4939	4997	5055	5114	5172	5230	5288		
	6			480 600 760 960 1064	507 617 740 879 1036	6226 5111 4260 3587 3043		45.28											
122	6	3	800HD	384	399	9434	74,000	61.02	-	-	-	5608	5666	5724	5782	5840	5898		
	6	2	800H	480 600 760 960 1064	507 617 740 879 1036	7470 6134 5111 4305 3651	45,000	55.12	4933	4991	5049	5108	5166	5224	5282	5340	5398		
150	4	3	800HD	480 600	495 654	9300 7039	74,000	61.02	-	-	-	5552	5611	5669	5827	5785	5843		
	4	2	800H	760 960 1064	760 926 1111	6087 4998 4165	40,500	55.12	4878	4936	4994	5052	5111	5169	5227	5285	5343		
180	4	3	800HD	480 600	495 654	11160 8447	74,000	61.02	-	-	-	5641	5699	5757	5815	5873	5931		
	4	2	800H	760 960 1064	760 926 1111	7304 5997 4998	40,500	55.12	4966	5024	5062	5141	5199	5257	5315	5373	5431		

Standard RL ➔

Idler Pulley	Model UT630M	22,000	29.53	765	788	810	832	852	874	897	919	941	See Note[4]	AL90 & ALO90
	Model UT630H	45,000	45.28	1608	1643	1678	1713	1749	1784	1819	1854	1889		

1 Use "nominal belt speed" to specify pulley. "Actual belt speed" is presented (for pulley lagged with 3/8" thick rubber) to assist with process design calculations. See Technical Precautions page 79. Note that "actual belt speed" decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding "Maximum radial load" defined above. See "Belt Tension" section in Technical Precautions, page 80.

4 Additional Motorized Pulley weight: Model 800M: 53.15"≤ RL ≤ 78.74" Wt = 16.1 lbs/in; Model 800H & 800HD: 66.93"≤ RL ≤ 78.74" Wt = 31.5 lbs/in.
Additional Idler Pulley weight: Model UT630M: 53.15"≤ RL ≤ 78.74" Wt = 11.2 lbs/in; Model UT630H: 66.93"≤ RL ≤ 78.74" Wt = 18.0 lbs/in.

5 Weights above include mounting brackets and are for pulleys "fully lagged" with 3/8" thick rubber. For "partially lagged" model 800M add 5% to 8% (for 800H add 3% to 4%) to the weights shown above. See pages 47, 82, & 83 for "partial lagging." To calculate unlagged pulley weight subtract 0.9 lbs/in of RL from above.

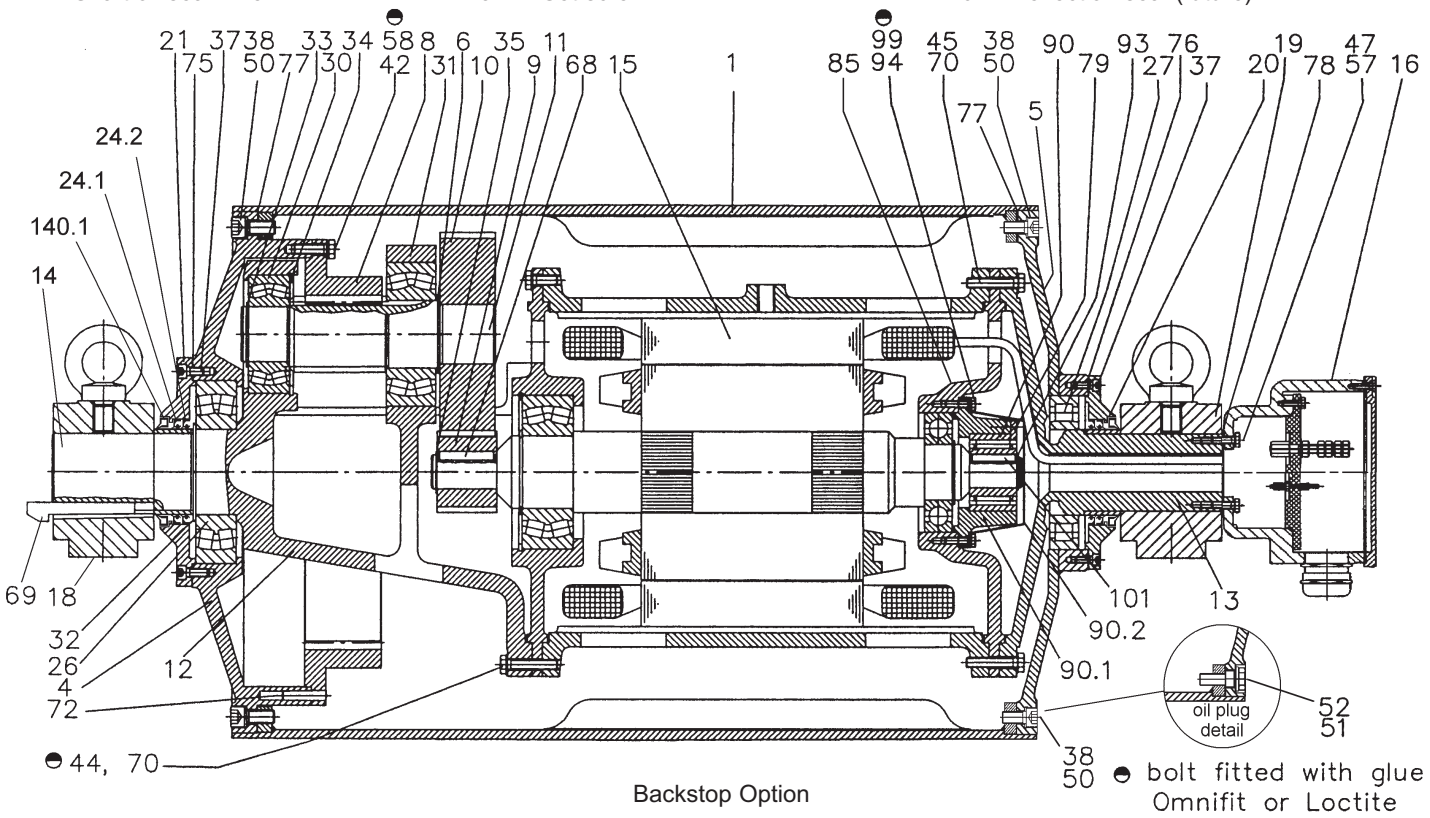
Motorized Pulley 800M & 800H 31.50 in. (800mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
4	End housing with geared rim
5	End housing
6	Distance washer
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box including rear shaft
13	Front shaft
14	Rear shaft
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple (for 500H/630M only)
18	Mounting bracket rear side
18.1	Mtg bracket rear side (lab option)
19	Mounting bracket front side
19.1	Mtg bracket front side (lab option)
20	Cover ñ front side
20.1	Cover with labyrinth groove
21	Cover ñ rear side
22.1	Cover with labyrinth groove
23	Rear flange
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner

Pos.	Description
24.3	Shaft oil seal inner (lab option)
24.4	Shaft oil seal outer (lab option)
26	Bearing
27	Bearing
30	Bearing
31	Bearing
32	Retaining ring
33	Retaining ring
34	Retaining ring
35	Retaining ring
37	Hexagon socket screw
38	Hexagon socket screw
42	Hexagon head screw
44	Hexagon head screw
45	Hexagon head screw
47	Hexagon head screw
50	Washer
51	Gasket
52	Magnetic oil plug
57	Washer
58	Spring washer
68	Key
69	Gib key
70	Waved spring washer
72	Grooved pin
73	Set screw

Pos.	Description
75	Gasket
76	Gasket
77	Gasket
78	Gasket
79	Holding plate
85	Motor flange for backstop/brake
90	Backstop
90.1	Backstop housing
90.2	Backstop cover
93	Retaining ring
94	Hexagon head screw
99	Spring washer
101	Key
123	Grease nipple
130	Brake shaft
131	Mounting bracket bearing cover
132	Roller bearing
133	Brake shaft seal
134	Brake shaft seal
135	Retaining ring
136	Bolts - bearing cover
137	Spring lock washer
138	Key
139	Retaining ring
140	Key
140.1	Deflection seal (future)



Backstop Option

Motorized Pulley 800HD 31.50 in. (800mm)

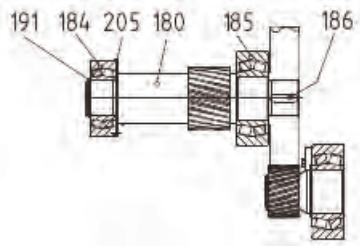
Spare parts list and sectional drawings

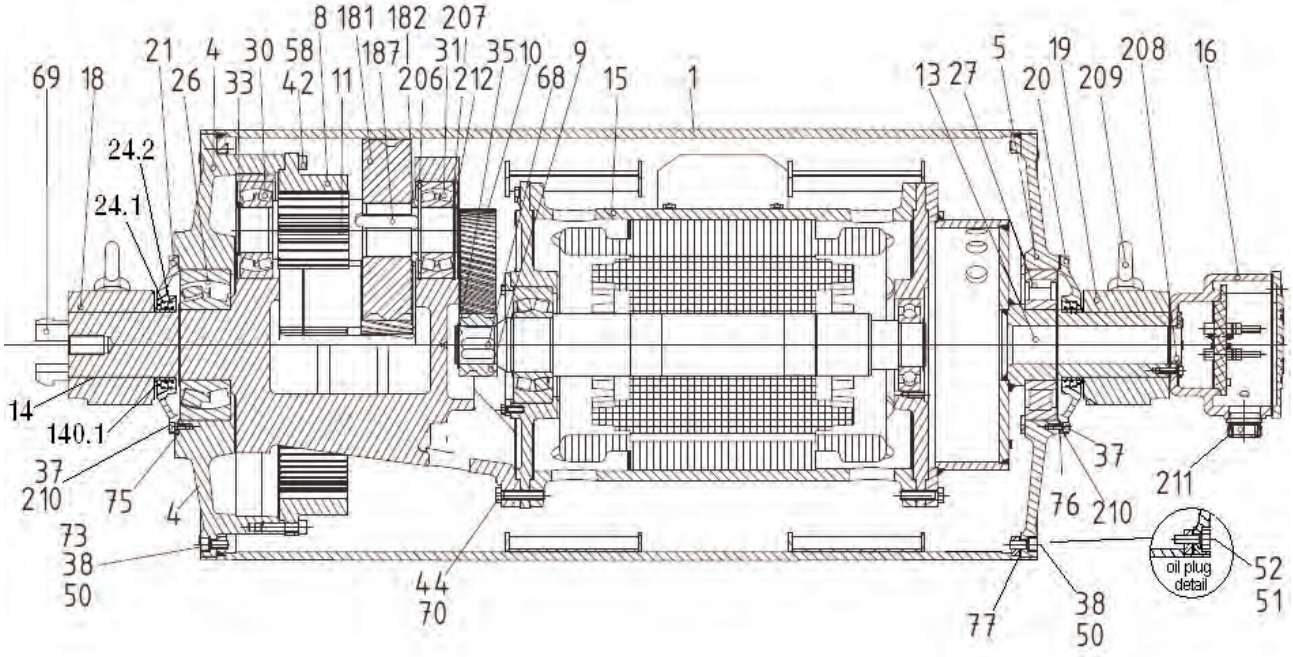
Pos.	Description
1	Shell
4	End housing with geared rim
5	End housing
6	Distance washer
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box ñ cast steel
13	Front shaft
14	Rear haft
15	Stator complete
16	Terminal box complete
20	Cover ñ front side
20.1	Cover with labyrinth groove
21	Cover ñ rear side
21.1	Cover with labyrinth groove
24.1	Shaft oil seal outer
24.2	Shaft oil seal inner
24.3	Shaft oil seal inner (lab option)
24.4	Shaft oil seal outer (lab option)

Pos.	Description
26	Bearing
27	Bearing
28	Bearing
30	Bearing
31	Bearing
32	Retaining ring
33	Retaining ring
34	Retaining ring
35	Retaining ring
37	Hexagon socket screw
38	Hexagon socket screw
42	Hexagon head screw
44	Hexagon head screw
45	Hexagon head screw
47	Hexagon head screw
50	Washer
51	Gasket
52	Magnetic oil plug
58	Spring washer
68	key
69	Gib key
70	Waved spring washer
72	Grooved pin
73	Set screw
75	Gasket
76	Gasket
77	Gasket
78	Gasket
85	Motor flange for backstop
90	Backstop complete
123	Grease nipple
130	Brake shaft
131	Mounting bracket bearing cover
132	Roller bearing

Pos.	Description
133	Brake shaft seal
134	Brake shaft seal
135	Retaining ring
136	Bolts ñ bearing cover
137	Spring lock washer
138	Key
139	Retaining ring
140	Key
140.1	Deflection seal (future)
188	Retaining ring
189	Retaining ring
190	Retaining ring
180	Intermediate pinion shaft
181	Intermediate pinion
182	Distance bushing
183	Washer
184	Roller bearing
185	Roller bearing
187	Key
191	Retaining ring
192	Retaining ring
193	Distance washer
194	Set screw
195	Prevailing torque type hex nut
196	Key
197	Retaining ring
205	Retaining ring
206	Retaining ring
207	Retaining ring
208	Protective ring
209	Eye bolt
210	Washer
211	Cable gland
212	Retaining ring
220	Insulation plate

Intermediate stage

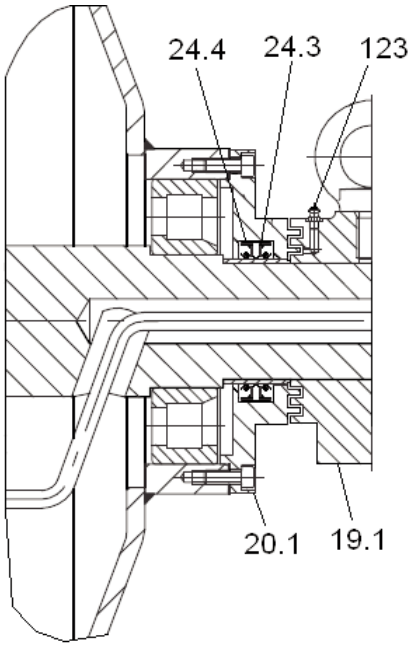




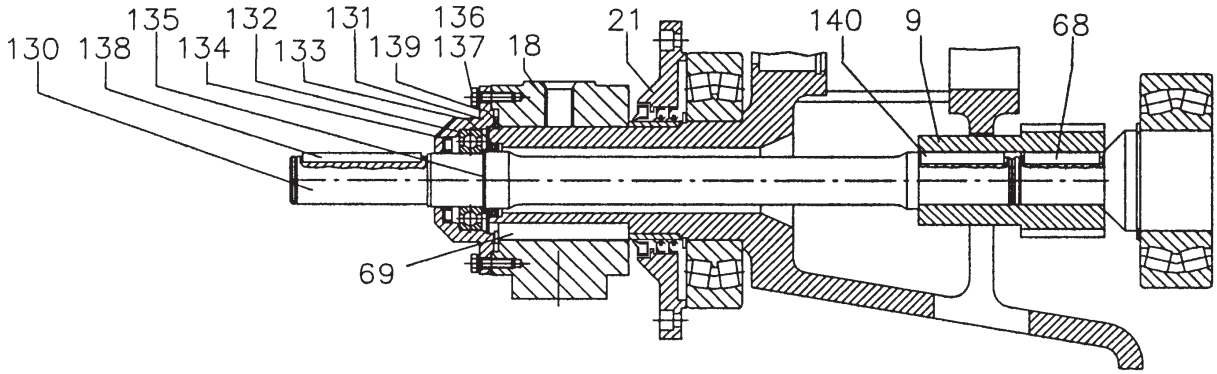
Motorized Pulley 800M, 800H, & 800HD Ø31.50 in. (800mm)

Sectional drawings

Labyrinth Seal Option



External Brake Shaft Option



Motorized Pulley 1000HD, Ø 40.16 in. (1020 mm)

The RULMECA Motorized Pulley type 1000HD is a highly developed reliable and strong drive with a power range of 220—330 HP. It is able to take a high radial load and robust in design. Therefore it is especially developed for use in:

- Mining conveyors,
- Excavators,
- Stackers,
- Reclaimers, and
- Ship loading conveyors.

The motorized pulley 1000HD is designed for tough, irregular, extreme and brutal working conditions.

The compact design allows the design engineers to save material and cost when developing the conveyor.

With its high protection rating and its standard labyrinth sealing system, this Motorized Pulley can be used in all ambient conditions.

STANDARD SPECIFICATION of Motorized Pulley

- Crowned mild steel shell, outside diameter 40.16 in.
- Mild steel shafts.
- Totally enclosed cast iron brackets,
- Shell lagged with 0.39 in thick bonded ceramic lagging,
- Bearing houses from cast steel.
- Three stage cast steel gearboxes.
- Sealing system with degree of protection IP66/67 (EN60034-5).
- Terminal box from cast iron.
- 3-phase induction motors with 3 phase single voltage,
- Std. voltage 460v/3ph/60Hz,
- Please specify voltage.
- Motor winding insulation class H,
- 3 bimetallic thermal protectors connected in series, 2 temperature resistors PT100 and 3 PTC-resistors connected in series installed in the winding.
- Rotor dynamically balanced.
- 2 oil plugs (with magnet).
- Minimum roller length (RL = 55.12 in at 220 HP & 59.06 in at 330 HP,
- Synthetic oil EP220.
- First oil change recommended after 50,000 operational hours.
- Regreasable labyrinth seals.

Please Note:

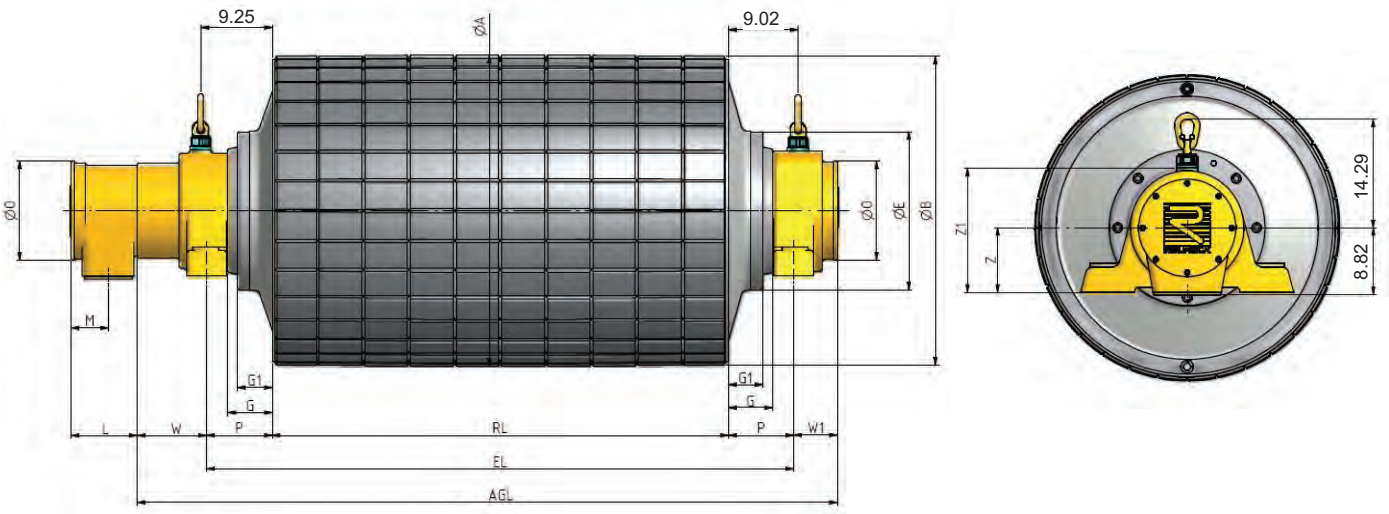
- **Special speeds**: available on request.
- **Environmental conditions:** See pages 76 -77.
- **Technical precautions:** See pages 78 - 98.
- **Optional extras:** See below.
- **Connection diagrams:** See page 92.

OPTIONAL EXTRAS

Specification	Availability
Different types and shapes of ceramic lagging	x
Mechanical backstop	x
Dust explosion proof Motorized Pulleys - ATEX 95 - Zone 22 - for applications handling of dusty grain etc. According to European Directive 94/9/EC.	x
Degree of protection IP66/67	Std.
Allowable ambient temperatures -13 degrees F to +120 degrees F	Std.
External brake shaft (for mechanical brake by others)	x
Motor protection and control by 3 bimetallic thermal protectors connected in series, 2 temperature sensors PT100 and 3 PTC-resistors connected in series	Std.
Insulation class H with synthetic oil	Std.
Thermal winding protection	Std.
Voltage US (3 x 460V at 60 Hz), Europe (3 x 690V at 50 Hz,) with tolerances +/- 10% (DIN IEC 38)	Std.
IP66/67 cast iron terminal box	Std.
Other voltages from 400V up to 1000V	x
CSA approved motors	x

x = Optional extras
Std. = Fitted as standard

Motorized Pulley 1000HD, Ø 40.16 in. (1020 mm)

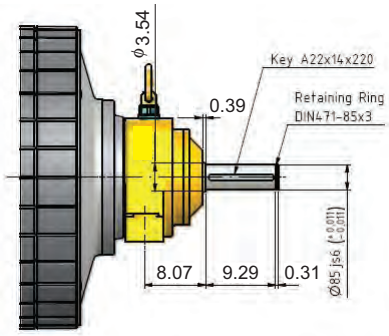


Motorized Pulley Dimensions

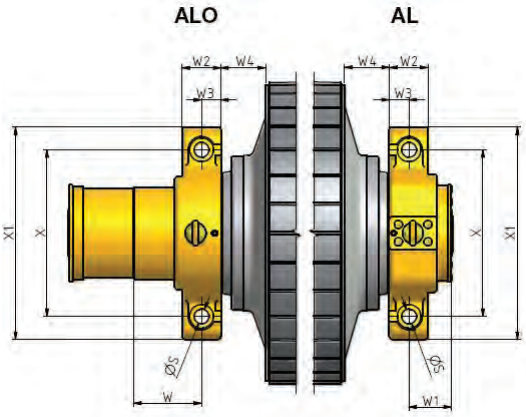
Type	A[1] in	B[2] in	D[3] in	E in	G in	L in	M in	O in	P in	W in	W1 in	W4 in
1000HD	40.16	39.92	7.99	20.47	5.71	8.58	4.80	12.79	8.46	8.98	5.63	5.91

1 A dimension is outer diameter of lagged pulley shell at pulley centerline.
2 B dimension is outer diameter of lagged pulley shell at each end of shell.
3 D dimension is shaft diameter.

Standard External Brake Shaft Dimension



* All dimensions are in imperial units, except for brake shaft diameter, key, and retaining ring, which are metric.



Bracket Dimensions

Type*	S in	W2 in	W3 in	X in	X1 in	Z in	Z1 in
AL	1.97	5.12	2.56	22.05	28.23	8.46	16.22
ALO	1.97	5.12	2.56	22.05	28.23	8.46	16.22

* AL is drive side bracket and is locked against rotation.
ALO is non-drive side bracket and is free to rotate.

Motorized Pulley 1000HD, Ø 40.16 in. (1020 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>70.87" available on request) Weight in lbs[5]								
Power HP	No. of Poles								55.12	57.09	59.06	61.02	62.99	64.96	66.93	68.90	70.87	longer than 70.87
220	4	3	1000HD	600 756 960 1080 1320	- - - - -	13,354 10,746 8,453 7,351 6,160	67,443	55.12	9,259	9,414	9,513	9,656	9,800	9,943	10,086	10,229	10,373	See Note[4]
270	4	3	1000HD	600 756 960 1080 1320	- - - - -	16,703 13,489 10,566 9,206 7,756	67,443	57.09	-	9,811	9,965	10,064	10,207	10,351	10,494	10,637	10,781	
330	4	3	1000HD	600 756 960 1080 1320	- - - - -	20,885 16,838 13,219 11,521 9,689	67,443	59.06	-	-	10,362	10,516	10,615	10,759	10,902	11,045	11,188	

Standard RL →

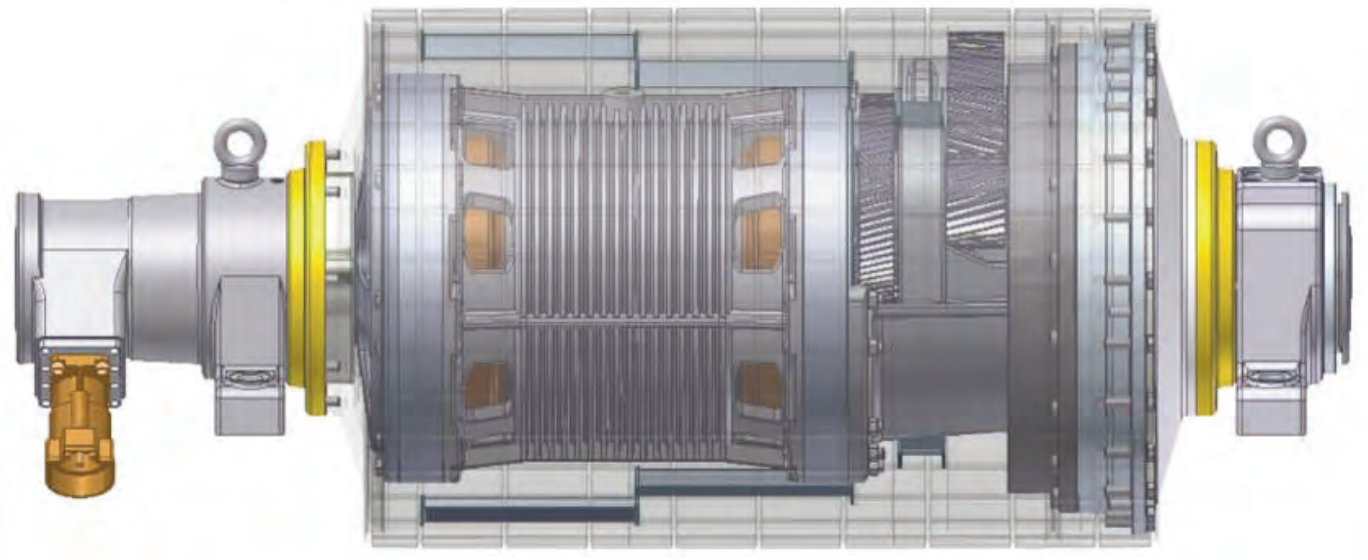
1 Use "nominal belt speed" to specify lagged pulley. "Actual full load belt speed of lagged pulley," when available, will assist with process design calculations.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding "Maximum Radial Load" defined above.

4 Additional Motorized Pulley weight: Model 1000HD: 70.87"≤ RL ≤ 98.43" Wt = 72.7 lbs/in.

5 All weights shown above include mounting brackets and are for pulleys "fully lagged" with 0.39" thick ceramic.



Applications in Special Environmental Conditions

Abrasive, Wet, High Humidity Environments

Hermetically sealed carbon steel tube and end housings with standard paint are suitable for most bulk applications. However, aggressive environments may require regreasable seals, special finish, or stainless steel. See pages 86 - 87.

Articulating Conveyors

Electromagnetic brakes or external brake shafts for brakes (by others) provide suitable material "holdback" capability for articulating conveyors. Mechanical backstops will not work in this application because these conveyors elevate and lower material. See pages 59, 81, & 83.

Chemical/Corrosive Environments

Aggressive environments may require regreasable seals, special lagging material, special finish, or stainless steel. See pages 82, 83, 86, & 87.

Critical Speed Requirements

Actual belt speed is a function of motor pole number, gear ratio, and load. This catalog displays actual full load belt speed of a lagged Motorized Pulley at nominal voltage and 60 Hz to assist designers who need precise belt speeds. See page 79.

Dust & Gas Environments

Rulmeca Motorized Pulleys with IP67 sealing are available with optional certification for service in an ATEX 95 Class II ("dust explosion proof") Zone 22 atmosphere, according to European Union Directive 94/9EC article 8. Note that Rulmeca Motorized Pulleys are not "intrinsically safe" or "flame proof" and are not suitable for service in: Class I (gasses, vapors, & liquids), Class II Zone 20, or Class II Zone 21 environments. See page 81.

Elevating Conveyors

Mechanical backstops provide suitable material "holdback" capability for fixed position, non-reversing, inclined conveyors. See pages 59 & 83.

Food Handling

Regreasable seals, full stainless steel, and food grade oil, grease, and lagging material are suitable for this environment, which usually includes frequent high pressure/chemical wash down. See pages 82, 83, & 87.

High Altitude >3,300 ft Above Sea Level (ASL)

Standard Rulmeca Motorized Pulleys provide suitable performance in mountainous areas. When specifying motor power derate by 2.5% for elevations of 3,300-5,000' ASL and 5% for elevations of 5,000-6,600' ASL. Contact Rulmeca for assistance with higher elevations.

High Ambient Temperature

Standard Rulmeca Motorized Pulleys with Class F motor and standard oil are suitable for use in a maximum ambient temperature of 104 °F. Motorized Pulleys with Class H motor and synthetic oil are suitable for use in a maximum ambient temperature of 120 °F. For higher ambient temperature conditions contact Rulmeca. See page 80 & 91.

High Duty Cycle (Frequent Start/ Stops)

Model	Max. No. of Start/stops
138E	240 per hour
165E	180 per hour
220M & 220H	120 per hour
320L, 320M, 320H, 400L, 400M & 400H	25 per hour
500L, 500M, 500H, 630M, 630H, 800H, & 800HD	10 per hour
1000HD	5 per hour

Standard Rulmeca Motorized Pulleys are suitable for frequent starting and stopping, without the use of soft start devices, as shown above. More frequent starts/stops are possible through the use of optional special pulley construction and/or soft starters. Contact Rulmeca for details. See page 82.

Impact Loading

Conveyors subject to frequent impact loading (i.e. non-continuous material flow) may require higher motor power and stronger gearbox than indicated by "continuous flow" belt pull calculations. Contact Rulmeca. See page 80, 84, & 86.

Indexing (Induction) Conveyors

Electromagnetic brake provides excellent product "hold" capability in induction systems requiring "indexing." See page 81.

Applications in Special Environmental Conditions

Low Ambient Temperature

Rulmeca Motorized Pulleys with standard motor and oil are suitable for use in a minimum ambient temperature of -13°F. Optional food grade oil lowers the pulley operating temperature range to a minimum of -22°F. Contact Rulmeca for lower operating temperatures. Special oil, special seals, and internal anti-condensation heater may be required. See pages 79 and 91.

Marine Environment

Corrosive ocean environment often requires regreasable sealing system, stainless steel or special surface finish. See pages 86 and 87.

Noise-Sensitive Environments

In noise-sensitive areas (e.g. locations where public access to conveyors is permitted) certain Motorized Pulley design restrictions apply. Contact Rulmeca for special oil viscosities and quantities, specially balanced pulleys, and when to avoid the use of 2 pole motors.

Non-belt Applications

Special Motorized Pulley designs are available for “non-belt, V-belt, partial belt, and modular belt” applications. It is essential that each special application be designed to adequately dissipate heat from the pulley surface. Contact Rulmeca for assistance with these applications. See pages 79 and 86.

Non-horizontal Mounting (i.e. between 5° - 90° and Vertical)

Certain applications (e.g. self-cleaning electromagnet for tramp iron, pictured above, “tilted” package sortation conveyors, and “travelling wall”) require pulley shaft to be mounted out of the horizontal plane. This Motorized Pulley option requires extra oil, grease packed top bearing, and special electrical termination. Contact Rulmeca for assistance. see pages 84, 86, and 91.

Oily, Greasy, & Fatty Materials

Environments with high amounts oil, grease, and/or fat require special oil-resistant lagging. If they require frequent high pressure and/or chemical cleaning they may also require regreasable seals and stainless steel or special surface coating. See pages 82 and 87.

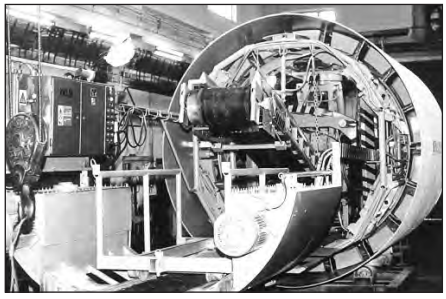
Reversible Conveyors

All standard three-phase Rulmeca Motorized Pulleys are suitable for use in reversing conveyors. However, motor control circuit must be designed to bring pulley to a complete stop before reversing direction. See page 87.

Starting Under Load

All Rulmeca Motorized Pulley motors are “Design C” and developed for direct starting. They provide 200% start-up torque when started directly. To reduce inrush (start-up) current it is possible to use starting device such as soft starter or variable frequency drive. Note that these devices may reduce start-up torque. See pages 84 and 88.

Underground Tunneling & Mining Applications



Rulmeca Motorized Pulleys have been incorporated into Tunnel Boring Machines (pictured above) for years. However, they are not “intrinsically safe” or “flame proof” and are not suitable for service where explosive gasses, vapors, liquids, or dust are continuously present. Contact Rulmeca for additional details.

Underwater applications

The Rulmeca Motorized Pulley IP67 sealing system has been successfully tested for 30 minutes under 1 m of water. However, the motor is not intended for continuous underwater service.

Variable Speed Conveyor

Two speed motor. AC frequency converter. See page 88.

Technical Precautions for Design, Installation and Maintenance

⚠ WARNING Read and follow all safety instructions! These instructions contain important sections on design, installation, safety, use, maintenance, parts replacement, and other technical information. Always include these instructions with pulley. Use these precautions with Rulmeca catalog TC-101.

⚠ CAUTION Read the manual before installing or operating the pulley. Failure to understand how to install or operate the pulley could cause personal injury or even death. Any modification made to or unintended use of the pulley could create a hazardous condition that could cause death or serious injury. Precautions which could effect warranty or create hazardous condition are marked with a safety symbol.

Contents

IMPORTANT INFORMATION!

• After unpacking the pulley, inspect carefully for any damage that may have occurred during transit. Check to be sure all supplied accessories are enclosed with the unit. If you have questions regarding safety or damaged or missing parts, please call one of your nearest RULMECA representative listed at the back of the manual.

• Also, for testing the pulley, shafts must be fixed to a frame properly before motor is connected to the power supply and switched on. The shell must be protected against accidental contact because of rotating.

• It is the responsibility of the contactor, installer, owner and user to install, maintain and operate the conveyor, components and conveyor assemblies in such a manner as to comply with:

The Occupational Safety and Health Act and with any and all state and local laws and ordinances as to the national and international standards as to:

- ANSI — B20.1 Safety Code and Conveyor Equipment Manufacturers Association (CEMA) voluntary consensus standards which may prevail,
- ANSI — Z535 Warning label Series
- ISO 3864-2 Product Safety labels

When existing equipment is being retrofitted, upgraded or even changed, it is in customer's best interest to bring the equipment up to today's standards. If there are any questions, please contact RULMECA.

NOTICE Refer to list shown below for explanation of the safety symbols used in this section of the catalog.

EX Do not install standard motorized pulleys in areas with potentially explosive concentrations of vapors, gases, mists and dust.

Technical Precautions for Design, Installation and Maintenance

Explanation of the symbols:

This is the alert symbol. It is used to alert you to potential bodily injury hazards.
Obey all safety messages that follow this symbol to avoid possible injury or death.

These instructions and other product accompanying literature contain information that is important to know and understand. To help recognize the information, observe these symbols.

DANGER Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION Caution indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE Notice indicates important information, that if not followed, may cause damage to equipment.

1) Actual Belt Speed vs. Nominal Belt Speed:

- Two key specifications for each Motorized Pulley are power (HP) and nominal belt speed, as shown on individual specification pages in this catalog.
- Nominal belt speed is a design target, providing consistent choices among all models and powers. For example, a nominal belt speed of 300 fpm is available in most pulley models.
- Actual full load belt speed is almost never exactly equal to nominal belt speed.
- Actual belt speed is a function of the motor pole number, gear ratio, and load. Therefore, this catalog displays actual full load belt speed at 60 Hz, as well as nominal belt speed, to assist designers who need more precise belt speeds.

NOTICE

- Note that all belt speeds shown in this catalog refer to lagged pulleys, as described in the speed chart footnote for each model.
- Note that each Rulmeca Motorized Pulley for a three-phase power supply uses an asynchronous squirrel cage induction motor with approximately 5% slip. In a no load condition, motor RPM is nearly equal to "synchronous speed" RPM. The slip rate is dependent on power and design of the motor. Low powered motors have a lower slip rate than high-powered motors. At full load, the motor RPM is approximately 5% less than synchronous.
- The "actual belt speed" displayed in this catalog is based on a lagged pulley running at full load, nominal voltage (e.g. 460 volts) and 60Hz.
- The maximum no load belt speed of this lagged pulley is 5% higher than the full load belt speed.

2) Aftermarket Service

- Always contact your local authorized Rulmeca service center or distributor for aftermarket service.
- Or contact Rulmeca at www.rulmecacorp.com

3) Ambient Temperature:

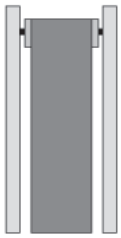
- Motorized Pulleys are normally cooled by dissipating heat through contact between the surface of the pulley and the conveyor belt. It is essential that each pulley have an adequate thermal gradient between the pulley's motor stator and its ambient operating temperature.
- All Motorized Pulleys in this catalog are designed and tested under full load for use in a max. ambient temperature of +104° F with standard Class F motor. Motorized Pulleys with Class H motors and synthetic oil are suitable for use in a max. ambient temperature of 120° F.
- For example, a conveyor belt in a facility with an air temperature of +75° F, carrying processed material at a temperature of +130 °F, will have a Motorized Pulley "ambient temperature" that is significantly higher than +75° F. In this example, the actual temperature of the bottom of the belt in the vicinity of the Motorized Pulley will be less than or equal to the material temperature, depending upon parameters such as conveyor length, belt thickness, and belt speed.

NOTICE

Technical Precautions for Design, Installation and Maintenance

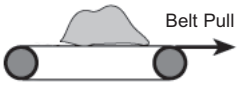
- For ambient operating conditions lower or higher than allowable ambient temperature (-22° F to 120° F), contact Rulmeca.
- All Motorized Pulleys shown in this catalog must be fitted with a conveyor belt to prevent overheating. Motorized Pulleys fitted without a belt must be referred to Rulmeca.
- It is possible to use specially designed Motorized Pulleys to perform tasks other than driving standard rubber conveyor belt (e.g. modular plastic belts and v-belts for Motorized Pulley types 138E & 165E.) Please contact Rulmeca for such applications.
- Operating Rulmeca Motorized Pulleys to drive standard conveyor belts outside of the allowable ambient temperature range *voids product warranty.*

4) Belt Alignment:



- Motorized Pulleys must be installed with pulley shaft perpendicular to belt centerline and parallel to all idler rollers.
- Belt centerline must be straight and parallel to side walls of slider bed (if any) and perpendicular to idler rollers and all pulleys
- Belt and/or roller misalignment may cause high friction and overload the conveyor belt drive motor.
- Belt misalignment may cause premature wear of pulley lagging.

5) Belt Pull:

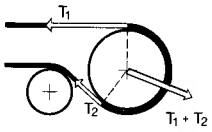


- This catalog specifies "Actual Belt Pull" for each model, power, and speed of pulley. Note that the specified actual belt pull allows for a motor and gearbox efficiency loss of 3 to 5%.
- Always select the Motorized Pulley power by comparing calculated "Required Belt Pull (Te)" with "Actual Belt Pull" as listed in this catalog and not simply on the basis of calculated power (HP).
- Required Belt Pull is the sum of all forces required to convey material.

6) Belt Tension:

NOTICE

- The conveyor belt should never be over-tensioned. It should only be installed with sufficient belt tension to prevent belt slippage.
- Anti-slip lagging should be used to keep the radial load as low as possible to drive the belt without slipping .
- The maximum allowable radial load of each Motorized Pulley is specified in this catalog. Subjecting the Motorized Pulley to a higher than specified maximum radial load may damage internal components and shorten product lifetime and, therefore, *voids product warranty*.



- To check pulley radial load, do a vector summation of the loads on the pulley.
- For example, as shown in the diagram,
  1. Radial load equals T1 + T2.
  2. T1, tight side tension, equals Belt Pull (Te) plus T2.
  3. T2, slack side tension, is determined using CEMA standard calculations or DIN 22101 to provide enough friction between the pulley and the belt to drive the belt and limit belt sag between idlers.
- Belt type, belt thickness and minimum allowable pulley diameter must be selected according to Belt Supplier Requirements.

7) Capacitors (for Single Phase Motors):

- Each single phase Motorized Pulley requires an appropriate capacitor. For models 138E and 165E a "Run" capacitor is supplied with the pulley. Detailed information is available upon request. Using other than the specified Run capacitor and a current dependent switching relay may damage the motor and *voids product warranty*.
- The Run capacitor must be permanently connected to the motor, as shown in the connection diagrams.
- Rulmeca single phase motors are "permanent split phase motors." Each motor is supplied with two windings. They are designed so that an appropriately sized capacitor connected to one of the windings will start the motor rotating.
- Starting torque is limited to 70% of full running torque when a "Run" capacitor is used.
- It is possible to increase starting torque to 100% by adding a second appropriately sized capacitor (Start

capacitor) to the circuit. Note that this circuit must be designed to drop the starting capacitor out of the circuit after the motor has reached its nominal speed. Contact Rulmeca for more information on how to run single phase motors using Start and Run capacitors.

8) Clearance:

- It is necessary to design conveyor frame and all chutes such that structure and/or product jamming against the Motorized Pulley is avoided.
- The "non-rotating shaft" feature of Motorized Pulleys offers a higher margin of safety than exposed drives with rotating shafts However, Motorized Pulley end housings, lagging, or tube may be damaged if structure or product jams against pulley while it is rotating.

9) Dust Explosion Proof (ATEX 95) Motorized Pulleys:

- The assembly, connection and sealing of the cable for dust proof motorized pulleys marked as follows

II 3 D 135°C

must be double checked to avoid any explosion in case of emergencies.

- Make sure that the IP68 cable gland is properly fixed to the terminal box of the Motorized Pulley.
- Make sure that the cable is properly sealed inside the cable gland. Never use a cable gland with a protection rate lower than IP65.

10) Electrical Installation:

- The equipment manufacturer (OEM) must ensure that the Motorized Pulley is not put into operation before it is
  — Correctly installed,
  — Correctly connected to the power supply,
  — Correctly protected.
- A specialist must perform the electrical connection of the Motorized Pulley in accordance with electrical regulations. If in doubt, contact Rulmeca.
- A wiring diagram is always supplied with the Motorized Pulley. Always refer to the connection instructions and ensure that the motor power and control circuits are properly connected.
- A wiring diagram is inserted into the terminal box and into the booklet accompanying each Motorized Pulley.
- Standard Rulmeca Motorized Pulleys are delivered with clockwise rotation when viewed from the terminal box end of the Motorized Pulley.
- Always refer to the connection instructions and ensure that the motor is connected as required to the correct power supply.
- Connect system ground wire to grounding screw located in the terminal box.
- When using cable options the green/yellow wire must be connected to the system ground wire.

Marking of the earth screw

11) Electromagnetic Brake:

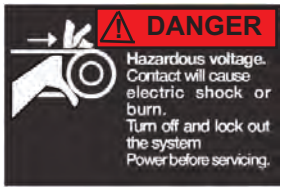
- The spring-loaded electromagnetic brake is intended for use as a conveyor belt holding device and not a conveyor belt stopping device.
- The control circuit for the Motorized Pulley motor and brake must be designed to stop the pulley motor before brake clamps shut and start the pulley motor after the brake is released.
- Spring-loaded electromagnetic brakes are designed to release when power is applied to the brake coil. This is a "fail safe" feature. They clamp shut when brake power is removed (either during normal operation or during an emergency loss of overall system power.)
- Control circuit must be designed so that motor and brake never work against each other. The brake should never be clamped shut when the motor is on except for "emergency stop" condition. The motor should never be powered on (including "jog" command) when the brake is clamped shut.

NOTICE

Technical Precautions for Design, Installation and Maintenance

- Electromagnetic brakes are DC-powered. They are supplied with AC to DC rectifiers to be mounted in a remote panel (by others). Rectifiers must be fuse-protected.
- Motor control circuit must be designed to kill motor power in the event of loss of brake power. If this safety provision is not made, it is possible for pulley motor to be “powered through” a clamped brake, burning brake and/or motor.
- A wiring diagram is supplied with every Motorized Pulley. Always ensure that motor and brake power and control circuits are connected according to instructions. Wiring diagrams are available separately, at any time, upon request.
- For rectifier connection and protection instructions, refer to rectifier data sheet supplied with Motorized Pulley.
- Neglecting these instructions could cause damage to the motor and/or brake and *voids product warranty.*

12) Guarding and Lock Out/Tag Out:



- If repair or maintenance is required, the Motorized Pulley must be disconnected from the power supply before the terminal box can be opened. Turn the electrical power off at the electrical panel board (circuit breaker or fuse box) and lock and tag the panel board door to prevent someone from turning on power while unit is being serviced. Failure to do so could result in serious electrical shock, burn, or possible death.
- During a test run, the shaft ends must be correctly fixed to the support frame, and suitable guarding must be provided around the rotating parts for the protection of all personnel.

WARNING: DO NOT operate without guards in place. Failure to follow these instructions could result in death or serious injury.

13) High Duty Cycle:

- Rulmeca Motorized Pulleys are designed to operate either continuously or intermittently. Page 72 gives each standard model’s maximum allowable start/stop duty cycle for intermittent operation. Operating Motorized Pulley above this maximum could cause motor and/or gearbox damage and *voids product warranty.*
- Optional Motorized Pulley designs are available to operate at higher duty cycles working with soft start devices or appropriately programmed Variable Frequency Drives. Contact Rulmeca before designing a system to operate at a duty cycle higher than specified in this catalog.
- Note that a conveyor control system that incorporates a “jog” command should be timed to restrict the number of jogs to the maximum allowable start/stop duty cycle for each pulley model.

14) Lagging Description:

- Smooth and diamond pattern lagging is available in black synthetic rubber and white synthetic rubber. Approximate rubber hardness is 65 durometer +/- 5 (shore hardness A).
- Standard lagging is cold-bonded to pulley shell.
- Optional hot vulcanized lagging is available for high power/high torque/high temperature applications.
- Oil & grease resistant synthetic rubber is also available for oily operating conditions and/or certain types of belting material. Check with belting supplier if belt/lagging material compatibility could be a problem.
- Adequate Motorized Pulley heat dissipation is necessary. Lagging thickness and width greatly effect pulley heat dissipation characteristics.
- As shown in Lagging Limitations table above, certain power and belt speed combinations require that rubber lagging be restricted to the outer thirds of the pulley face to improve heat dissipation. Each “partially lagged” pulley has a thick steel shell in the center (unlagged) third of the pulley face.
- Contact Rulmeca before applying any lagging to pulley surface to obtain thickness and width specifications and *maintain Motorized Pulley warranty coverage.*
- Lagging material is a wear item and should be replaced when it wears out. Service life depends upon the application. *Product warranty does not include lagging wear.*

NOTICE

- At any time all Rulmeca Motorized Pulleys shown in this catalog must be fitted with a conveyor belt to prevent overheating. Motorized Pulleys fitted without a belt must be referred to Rulmeca.

Technical Precautions for Design, Installation and Maintenance

15) Lagging Limitations*:

Motorized Pulley model/power and belt speed (if applicable)	RL (in)	Full Cold bonded 0.118"	Full Cold bonded 0.236"	Full Hot vulc. 0.236"	Full Cold bonded 0.315"	Partial Hot vulc. 0.315"	Full Cold bonded 0.394"	Full Hot vulc. 0.394"	Partial Cold bonded 0.394"	Partial Hot vulc. 0.394"	Full Cold Ceramic/ rubber 0.394"	Partial Cold Ceramic/ rubber 0.394"	Full Solid Ceramic 0.394"
138E													
≤ 0.5 HP		x	o	o	-	-	-	-	-	-	-	-	-
0.75 & 1.0 HP	<23.62	x	o	-	-	-	-	-	-	-	-	-	-
0.75 & 1.0 HP	≥23.62	x	o	-	-	-	-	-	-	-	-	-	-
0.75 & 1.0 HP ≥ 120 fpm	≥23.62	x	o	o	-	-	-	-	-	-	-	-	-
165E													
≤ 1.0 HP		x	o	o	-	-	-	-	-	-	-	-	-
1.5 & 2 HP	<23.62	x	o	-	-	-	-	-	-	-	-	-	-
1.5 & 2 HP	≥23.62	x	o	o	-	-	-	-	-	-	-	-	-
1.5 & 2 HP ≥ 240 fpm	≥23.62	x	o	o	-	-	-	-	-	-	-	-	-
220M & 220H													
≤ 2 HP		-	x	-	-	-	-	-	-	-	-	-	-
3 & 4 HP	<31.50	-	x	-	-	-	-	-	-	-	-	-	-
3 & 4 HP	≥31.50	-	x	-	-	-	-	-	-	-	-	-	-
5.5 HP	<27.56	-	-	x	-	-	-	-	-	-	-	-	-
5.5 HP	≥27.56	-	x	-	-	-	-	-	-	-	-	-	-
7.5 HP	<33.46	x	-	-	-	-	-	-	-	-	-	-	-
7.5 HP	≥33.46	-	x	-	-	-	-	-	-	-	-	-	-
320L - 320H													
≤ 7.5 HP		-	-	-	x	-	-	-	-	-	o	-	o
10 HP	<39.37	-	-	x	-	-	-	-	-	-	-	-	o
10 HP	≥39.37	-	x	-	-	-	-	-	-	-	-	-	o
400L		-	-	-	-	-	-	-	-	-	-	-	-
400M & 400H													
≤ 15 HP		-	-	-	x	-	-	-	-	-	o	-	o
20 HP < 300 fpm	< 51.18	-	-	-	-	x	-	-	-	-	-	-	o
20 HP ≥ 300 fpm	≥ 51.18	-	-	-	x	-	-	-	-	o	o	-	o
500L & 500M					x	-	x		x	x	x	x	x
500H													
≤ 25 HP		-	-	-	-	-	x	-	-	-	o	-	o
30 HP		-	-	-	-	-	-	-	o	x	-	o	o
40 HP		-	-	-	-	-	-	-	-	-	-	o	x
630M		-	-	-	-	-	x	-	-	-	-	o	o
630H													
30 HP		-	-	-	-	-	x	o	-	-	o	-	o
40 HP < 300 fpm	-	-	-	-	-	-	-	-	-	x	-	o	o
40 HP ≥ 300 fpm	-	-	-	-	-	-	-	-	o	x	-	o	o
50 HP	-	-	-	-	-	-	-	-	-	x	-	o	o
61 HP	< 51.18	-	-	-	-	-	-	-	-	x	-	-	o
61 HP	≥ 51.18	-	-	-	-	-	-	-	o	x	-	o	o
75 HP	-	-	-	-	-	-	-	-	-	x	-	o	o
800M													
61 HP	-	-	-	-	-	-	x	-	o	o	-	o	o
75 HP	-	-	-	-	-	-	-	-	-	x	-	o	o
800H													
75 HP	< 51.18	-	-	-	-	-	-	-	-	x	-	o	o
75 HP	≥ 51.18	-	-	-	-	-	-	x	o	x	-	o	o
100 HP	< 51.18	-	-	-	-	-	-	-	-	x	-	o	o
100 HP	≥ 51.18	-	-	-	-	-	-	-	o	x	-	o	o
122 & 150 & 180 HP		-	-	-	-	-	-	-	-	x	-	o	o
1000HD	-	-	-	-	-	-	-	-	-	-	-	-	x

* Lagging code: "x" = standard, "o" = optional, "-" = not available.

16) Mechanical Backstops:

⚠ CAUTION

- Motorized Pulleys fitted with mechanical backstops are used on inclined conveyors to prevent run back of the loaded belt when power supply is off.
- The backstop is built into the Motorized Pulley and is mounted on the rotor shaft.
- If pulley is supplied with optional mechanical backstop, direction of proper rotation of pulley is indicated by an aluminum arrow or plastic sticker fastened to the end housing on the terminal box (or power cord) side of the pulley. Clockwise and counterclockwise backstops are available.
- Rotation direction is to be specified when placing the order.
- Pulley rotation is specified from the point of view of a person looking at the pulley from the terminal box (or power cord) side of the pulley.

Technical Precautions for Design, Installation and Maintenance

- It is essential that the identity of each of the three phases of the power supply be determined before attaching power supply wires to the pulley to prevent the motor from driving against the backstop. The identity of each of the three phases of the motor is clearly labeled on the terminal board, terminal strip, or wires (in power cord type).
- Driving the motor against the mechanical backstop may damage motor and/or backstop and *voids product warranty.*

17) <u>Motor Current Overload and Overcurrent Protection:</u>

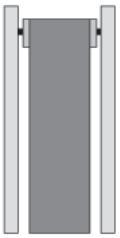
- Motor control system must include protection against operating pulley motors in excess of Full Load Amperage (FLA.). The control system should also include protection against voltage spikes and excessive jogging of motors. Failing to provide adequate current overload and over current protection could stress the motor and *voids product warranty*.
- Electrical connection diagrams for many models are included in this catalog. Connection diagrams for all other models are available upon request.
- FLA data is available for all motors upon request. FLA data is also supplied on motor label for each Motorized Pulley.
- Electrical power, control, and protection for Motorized Pulleys must adhere to all pertinent regulations.

NOTICE

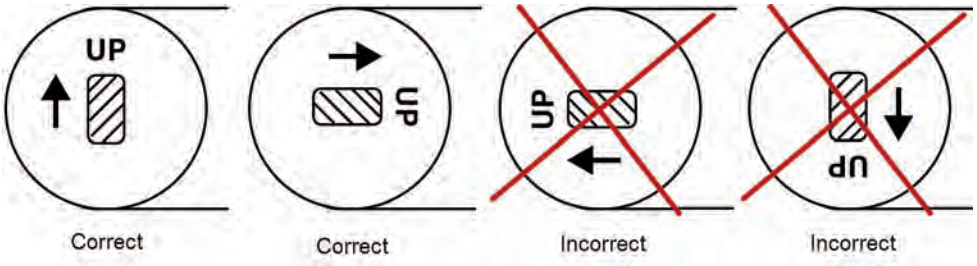
18) <u>Motor Thermal Protection:</u>

- All Motorized Pulley motors are supplied with built-in thermal protection. Protection consists of heat-sensitive, bi-metallic switches built into each motor phase winding. The switches are designed to open if motor temperature elevates to an inappropriately high level. Whether insulation class “F” or “H”, our standard bi-metallic switch
  — has a maximum current limit of 2.5 amps at 230 volts.
- These switches must be connected to a normally closed control circuit (in series with a magnetic coil/relay device and contactor) in order *to validate product warranty*.
- A motor control circuit should kill motor power if thermal switch opens. Thermal switches will automatically close as motor cools. Cooling times vary with pulley model, power, and size. However, 30 to 60 minutes is common with most motors in an ambient temperature of 70° F.

19) <u>Motorized Pulley Mounting Orientation:</u>



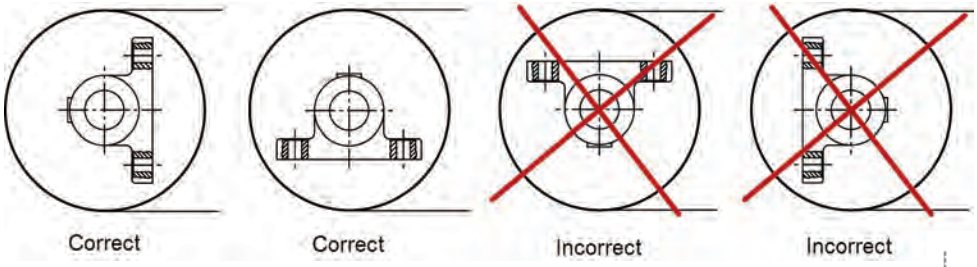
- Before installing the Motorized Pulley, ensure that the data plate information agrees with your specification.
- Rulmeca Motorized Pulleys should always be mounted so that the pulley shafts are
  1. Horizontal,
  2. Parallel to idler rollers, and
  3. Perpendicular to the conveyor belt centerline.
- Motorized Pulleys are positioned such that the mounting brackets are located parallel or perpendicular to the conveyor frame. If Motorized Pulley needs to be mounted to the bottom of a horizontal beam, contact Rulmeca.
- For Motorized Pulley types 138E to 500M “UP” is indicated with the word “UP” stamped on the pulley shaft.
- **Models 138E - 500M** are to be mounted as shown on the sketch below.



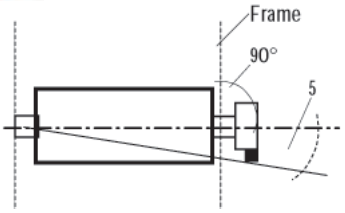
NOTICE

Technical Precautions for Design, Installation and Maintenance

- **Models 500H - 1000HD** are to be mounted as shown on the sketch below.



NOTICE



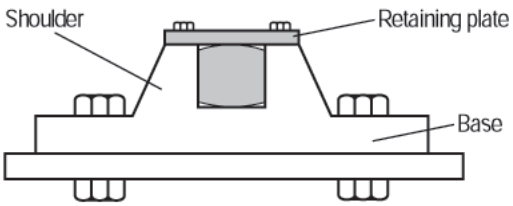
- *In case of a non-horizontal installation, of more than +/-5 degrees, consult Rulmeca.*
- Installation and mounting of the Motorized Pulley in a position other than those described above could cause severe product damage and *voids product warranty.*

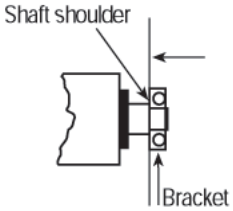
20) <u>Mounting Brackets:</u>

- Use the correct Rulmeca mounting brackets matching the respective types of Motorized Pulleys as listed in this catalog.

NOTICE

- Note that it is physically possible, but not permissible, to interchange mounting brackets between models. Mounting brackets designed for smaller diameters or lower-powered pulleys may not be used for larger diameters or higher-powered pulleys.
- Mounting brackets must be mounted to frame such that belt pull is resisted by the shoulder or base of the mounting bracket. Motorized Pulleys types 138E to 500M have a top shaft retaining plate. This plate is not designed to resist belt pull.

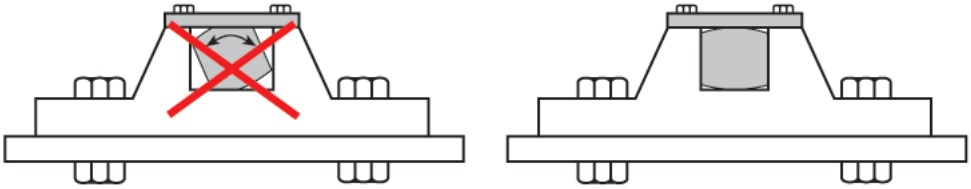




NOTICE

- The designer must select appropriate mounting bolts to resist belt forces and/or the weight of the pulley depending on the mounting position of the Pulley.
- All types of mounting brackets must be fully supported by and fastened to the conveyor frame such that the shafts ends do not deform. Shaft ends must always be fully supported by the brackets.
- Where solid mounting brackets type AL and ALO are used, the brackets must be assembled close to the shoulder of the round shaft. This is to ensure that the Motorized Pulley has no axial clearance.
- The AL type of bracket is fitted with one or two keys depending on load.
- Keys must be securely fixed and checked regularly and locked if necessary.
- Mounting brackets should be fitted such that they are in contact with the shoulder of each shaft. This will:
  1. Eliminate Motorized Pulley axial play between mounting brackets.
  2. Keep shaft deflection to a minimum.

NOTICE



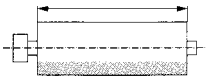
Technical Precautions for Design, Installation and Maintenance

- In noise-sensitive areas, the designer should use heavier gauge support structure and appropriate vibration isolating material, as necessary.
- When Rulmeca Motorized Pulley mounting brackets are not used, it is essential that: **NOTICE**
  1. The mounting equipment supports at least 80% of the shaft flats.
  2. The clearance between each shaft flat shoulder and its support is less than 0.030 inches.
- A Motorized Pulley with frequent reversible operations or many start/stops should be mounted with no axial clearance between the shaft flat and the brackets.
- Failing to follow these precautions could cause pulley and/or bracket damage and *voids product warranty.*

21) Non-Belt, Partial Belt, Modular Belt:

- Special Motorized Pulley designs are available for “non-belt, V-belt, partial belt, and modular belt” applications. See “Ambient Temperature Section” above.
- It is essential that each special application be designed to adequately dissipate heat from the pulley surface.
- Using a standard Motorized Pulley in one of these special applications could result in motor heat damage and *voids product warranty.* **NOTICE**
- Contact Rulmeca for assistance with these applications.

22) Oil and Oil Seal Maintenance:



- All Motorized Pulleys are supplied with an appropriate quantity of oil. Oil type is specified by customer. Oil type and quantity are given on the motor nameplate.
- Standard, synthetic, food grade, low viscosity (for low temperature applications,) and high viscosity (in noise-sensitive areas) are all available. For approved oil types and quantities, see pages 90-91.
- Motorized Pulleys require periodic oil changes and are supplied with two oil fill/drain plugs in end housing. Special “vertical mount” pulleys have four oil plugs (two in each end housing.)
- Mineral oil should be changed after each 20,000 operating hours under normal operating conditions.
- Synthetic oils should be changed after each 50,000 hours of normal operating condition.
- Magnetic oil plug(s) should be cleaned during each oil change. A red dot plastic sticker indicates the position of the magnetic oil plug.

- Only approved non-conductive oil may be used in Motorized Pulleys.
- Note that oil seals, regardless of oil type used, should be changed after 30,000 operating hours. On Motorized Pulley types 320M to 1000HD oil seals may be changed without removing Motorized Pulley from conveyor. Motorized Pulley standard types 138E to 320L require Pulley disassembly to change oil seals. Rulmeca service personal or authorized local service providers to perform this work.
- Take special precautions when changing brands of oil and types of oil because of potential oil incompatibility. Contact your local oil supplier for assistance.

  For example, when changing from standard to synthetic oil, it is necessary to: **NOTICE**

  1. Completely drain old standard oil;
  2. Partially fill pulley with “Clean-Flush-Lubricate” (CFL) fluid;
  3. Run pulley for 20 minutes;
  4. Drain CFL fluid completely; then
  5. Fill pulley with appropriate amount of new synthetic oil.
- Failing to observe these oil & oil seal precautions could shorten pulley service life and *voids product warranty.*
- All the above instructions refer to Motorized Pulleys constantly working under full load. In case of Motorized Pulleys not working continuously under full load, the service life will increase considerably. When checking the oil, the cleanness of the oil is always the best guideline of

  — The wear and condition of the gears and bearings
  — Whether to change the oil immediately or possibly delay the oil change

23) Pulley Diameter:

- The type and size of conveyor belt will determine the minimum allowable Motorized Pulley diameter. Using a pulley diameter too small for the belt can cause belt de-lamination, belt splice damage and can shorten both belt and pulley lagging life. Contact your belting supplier before specifying a pulley diameter.

Technical Precautions for Design, Installation and Maintenance

24) Regreasable Labyrinth Seals:

- All Rulmeca Motorized Pulleys are hermetically sealed. Standard oil seals are designed to contain oil within the Motorized Pulley during normal operating conditions. They are capable of withstanding an internal pressure rise that occurs as the pulley motor temperature increases.
- Optional regreasable labyrinth seals are available to protect oil seals from harsh operating or maintenance conditions. Each labyrinth seal provides a barrier of steel and grease to prevent ingress of dust and fluid through the oil seal.
- In abrasive operating conditions labyrinth seals should be periodically grease-purged to flush abrasive dust away from the oil seal.
- In wet conditions, where it is common to wash down equipment with high-pressure detergent spray, labyrinth seals should be refilled with grease after each wash-down. High-pressure sprays remove grease from the labyrinth seal, removing an important part of the barrier to fluid ingress.
- Grease should always be seen at the labyrinth gap.
- If in some circumstances the re-grease frequency is high, an automatic greasing system is recommended.
- Failing to perform proper labyrinth seal maintenance could shorten service life and *voids product warranty.*

25) Reversing Conveyors:

NOTICE

- All Motorized Pulleys for a three-phase power supply are reversible. Mechanical backstop option is not possible for reversible conveyor applications.
- The conveyor drive control system must be designed to bring the Motorized Pulley to a complete stop before reversing conveyor belt direction.
- Reversing conveyor direction without stopping the drive motor will damage motor and gearbox and *voids product warranty.*

26) Surface Coating:

NOTICE

- Motorized Pulley models 400L to 800H are supplied with a standard salt water resistant primary paint coat of 2.4 mil. For aggressive environmental conditions the Motorized Pulley should also be painted to a thickness of 4.7 mil.
- In this case it is essential that no paint enter the gap between the shaft and the end housing to prevent shaft sealing damage.
- Motorized Pulley types 138E to 320H are supplied with powder coated end housings. The shells and shafts are treated with anti-rust wax.

27) Storage of Motorized Pulleys:

- During storage Rulmeca Motorized Pulleys must be:
  — stored in a building or, as a minimum, covered by an awning.
  — protected against direct sunlight to insure that sealing system does not dry out.
  — rotated at least 180 degrees every 6 months to lubricate all internal components.
- If Motorized Pulleys must be stored longer than 1 year, they must be tested before being put into operation. Such a test should include the following.
  — Motor winding should be checked with an insulation tester.
  — Winding resistance should be checked.
  — Thermal protector should be checked with a continuity tester.
  — Pulley should be connected to the power supply and run for a minimum of 30 minutes
  — Pulley should then be checked to verify that there are no oil leaks
  — Pulley should then be checked to verify that pulley body temperature does not exceed 160° F.
- For safety reasons check that the Motorized Pulley is properly fixed to the test frame during the test.

28) Start-up:

- Prior to initial start-up of Motorized Pulley:
  — Verify that Motorized Pulley nameplate data matches customer specification.
  — Ensure electrical connections are correct.
  — Check that Motorized Pulley is free to rotate.

Technical Precautions for Design, Installation and Maintenance

— Check that slack side belt tension is adequate to prevent belt slippage.
— Check that belt is not over-tensioned.
— Ensure that oil is present in the Motorized Pulley.

29) Terminal Box:

- Motorized Pulleys are available with terminal boxes or power cords. Power cords are available for motor power ≤ 5.5 HP.
- Two types of terminal box are available:
  1. Standard large terminal box with threaded brass terminals.
  2. Optional compact t'box with clamp terminals for power ≤ 5.5 HP.
- Switch off power supply & control circuit(s) before opening t'box.
- Each terminal box has one or more conduit nipples and a cover plate. Cover plate should be removed to facilitate termination of power and control wires within the t'box. After wire connections are made cover plate should be replaced.
- Terminal boxes should never be disassembled or removed from the end of the shaft.
- Modifications to terminal boxes should only be made by an authorized Rulmeca service center or after obtaining permission and instructions, in writing, from Rulmeca.
- A wiring diagram is placed inside the terminal box on the back of the terminal box cover.
- Dismantling and reassembling a terminal box could cause a short circuit in the factory set (and tested) internal wiring and *voids product warranty.*


Compact t'box


Stan. t'box 165E-400L


T'box cover with wiring diagram


Stan. t'box 400M-630M


Stan. t'box 630H-800HD

NOTICE

30) Transport and Handling:

- For safety reasons during transport and assembly a lifting rope suitable to support the weight of the pulley must be used. The weight of the pulley is stamped on the data plate and /or given in the catalog.
- The rope must be fixed on the shaft ends.
- For Motorized Pulley types 500H — 1000HD, a steel rope or chains should be fixed to the eyebolts, which are located on the mounting brackets.

31) Variable Frequency Drive:

- It is essential that each Variable Frequency Drive (VFD) be set within the motor's allowable operating frequency spectrum. This is to insure proper cooling of the motor. If operators attempt to drive the motor outside of the allowable range, then motor cooling can become problematic, and *product warranty is void*.
- When driving Rulmeca Motorized Pulleys with "old" analog VFDs, the allowable frequency spectrum is 12 Hz to 66 Hz. There will be no more than 5% torque loss within this range with these devices. That means that a Rulmeca Motorized Pulley may be set to deliver essentially "constant torque" within the allowable frequency range. However, do not undersize the conveyor drive when configured in this manner, making certain the conveyor drive provides enough belt pull at each end of the desired belt speed range. Remember that horsepower is linearly proportional to frequency.
- When driving Rulmeca Motorized Pulleys with newer flux vector VFDs, the allowable frequency spectrum may be extended significantly. Ranges of 1 Hz to 100 Hz are possible, depending on various parameters incuding but not limited to ambient temperature, nominal belt speed, and required belt pull. Contact Rulmeca for assistance with these applications.
- Do not allow resonant frequencies in the power line to cause voltage spikes in the motor. It is possible for certain brands of VFD to set up resonant frequencies in the power line between the VFD and the motor if the power line is too long. Potential resonant frequencies may be eliminated as follows: (1.) limit the distance between the VFD and the motor (some VFD manufacturers recommend cable lengths of 30 feet or less), (2.) install a filter on the VFD output (available from VFD manufacturer), and/or (3.) select a VFD which modulates pulse width in a manner so as to avoid resonance.
- To avoid any radio interference the cable from motor to the VFD may be screened and properly grounded.
- The power and current range of the VFD must be selected according to the full load amperage given on the Motorized Pulley data plate.
- Contact VFD supplier to properly match the VFD capabilities with the conveyor operating requirements and Motorized Pulley electrical characteristics.

NOTICE

Motorized Pulleys
Variable Frequency Drives

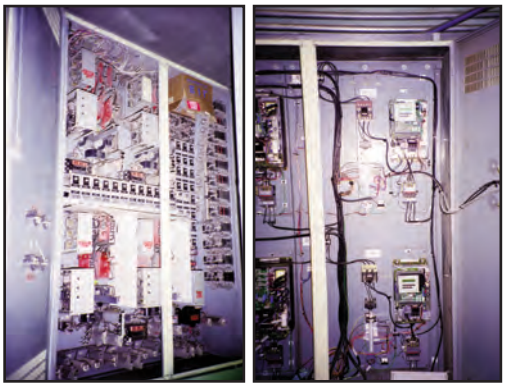
Cement Plant Weigh Feeder - (Oklahoma—USA)
Weigh Feeder, driven by a flux vector VFD, has 30" wide belt with 4" sidewalls and is powered by a 16" diameter 5.5 HP model 400H Motorized Pulley with a belt speed range of 0.8 to 80 fpm. Since amp draw and Motorized Pulley temperature were carefully monitored during commissioning, feeders are capable of moving a wide range of material throughput (from less than 1 tph to more than 100 tph.) VFDs automatically vary the power supply frequency from 1 Hz to 100 Hz.

Technical Precaution: Since Motorized Pulleys cool their motors by transferring heat through the pulley shell into the conveyor belt, it was essential to verify that adequate cooling was available through the wide frequency spectrum.

Cement Plant Dual Drive with Load-Sharing - (Oklahoma—USA)
A 550 foot long reclaim tunnel conveyor, fed by six feeders, has a concave vertical curve and elevates material from beneath the storage pile 138' up to the transfer tower. Original 75 HP drive in transfer tower was replaced by two 50 HP Motorized Pulleys, one on the tower and one in the tunnel, controlled and synchronized through the use of two flux vector VFDs.

Note : This control system insures load-sharing and provides overcurrent protection, ramp up and ramp down, and variable belt speed, if necessary.

The dual drive configuration also eliminated belt bounce in the vertical curve. Previously when the conveyor was started empty, it bounced up at least 4 feet and damaged the belt and feeder support structure.



Taconite Plant Control Panel- “Before & After” (Minnesota—USA)
Left photo shows control panel of taconite plant DC-powered variable speed conveyor control system before 1995 conversion to AC drives. Note SCR's, relay banks, and timer banks.

Right side shows control panel after conversion to AC motorized pulleys controlled with variable frequency drives. Elimination of SCR's and relay banks improved reliability, simplified troubleshooting, and reduced energy loss.

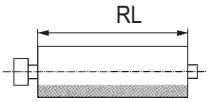
Technical Precaution: The power and current range of the VFD must be selected according to the full load amperage given on the Motorized Pulley data plate.

Various Limestone Quarries (Georgia—USA)
Photo shows two of ten 15.75” diameter Motorized Pulleys installed 1994-1998 to automatically “choke feed” tertiary gyratory crushers. Working in combination with a VFD and an ultrasonic sensor, each Motorized Pulley drives a 36” wide belt at a maximum speed of 120 FPM to transfer 4” minus product from hopper to crusher throat at 425 TPH.

Technical Precaution: Do not allow resonant frequencies in the power line to cause voltage spikes in the motor. Potential resonant frequencies may be eliminated by limiting the distance between the VFD and the motor, installing a filter on the VFD output, and/or selecting a VFD which modulates pulse width in a manner so as to avoid resonance.

Technical Precautions for Design, Installation and Maintenance

32) Oil Quantities in Quarts for Standard Motorized Pulleys in Horizontal Applications



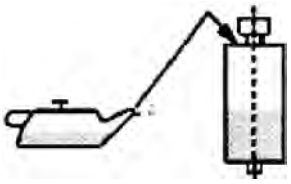
Quarts

RL (in.)	138E	165E	220M & 220H		320L	320M & 320H			400L	400M & 400H		500L & 500M	500H	630M	630H	800M	800H & 800HD	1000HD
	all	all	0.5 HP to 2.0 HP	3.0 HP to 7.5 HP	all	1 HP to 4 HP	5.5 HP to 7.5 HP	10 HP to 15 HP	all	3 HP to 15 HP	20 HP	all	all	all	all	all	all	all
11.81	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.78	1.0	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.75	1.2	1.5	3	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-
17.72	1.4	1.7	4	7	7	-	-	-	-	-	-	-	-	-	-	-	-	-
19.69	1.6	1.9	4	7	8	4	8	13	17	-	-	-	-	-	-	-	-	-
21.65	1.9	2.1	5	8	8	4	9	14	18	-	-	-	-	-	-	-	-	-
23.62	2.1	2.4	5	8	9	4	9	15	19	14	22	-	11	-	-	-	-	-
25.59	2.3	2.6	6	9	10	4	10	16	21	16	23	22	11	-	-	-	-	-
27.56	2.5	2.8	6	9	10	5	10	17	22	17	25	23	12	-	-	-	-	-
29.53	2.7	3.1	7	10	11	5	11	17	23	18	26	24	12	29	-	-	-	-
31.50	3.0	3.3	7	10	11	6	11	18	25	19	27	25	13	30	-	-	-	-
33.46	3.2	3.5	7	10	12	6	12	20	26	20	29	26	13	31	-	-	-	-
35.43	3.4	3.7	7	10	13	6	13	21	27	21	30	27	14	32	-	-	-	-
37.40	3.6	3.9	8	11	14	7	14	22	29	22	31	30	15	34	54	65	-	-
39.37	3.8	4.1	8	11	15	7	15	23	31	24	35	32	16	36	56	68	-	-
41.34	3.8	4.3	8	11	15	7	16	24	33	25	36	33	16	38	57	70	-	-
43.31	4.0	4.6	8	11	16	7	17	25	34	26	39	34	17	40	60	73	-	-
45.28	4.2	4.9	9	12	17	8	18	27	36	27	40	36	18	42	62	75	-	-
47.24	4.4	5.1	9	12	19	8	19	29	38	29	42	38	19	44	64	77	-	-
49.21	4.6	5.3	9	12	20	9	20	30	39	30	43	39	19	46	66	79	-	-
51.18	4.9	5.5	9	12	21	9	21	31	40	31	44	40	20	48	68	80	137	-
53.15	5.1	5.7	10	13	22	10	22	33	42	32	47	42	21	49	70	82	141	-
55.12	5.3	5.9	10	13	23	10	23	35	44	34	49	44	22	51	72	84	143	254
57.09	5.4	6.1	10	13	24	11	24	36	46	35	51	45	23	52	74	86	145	257
59.06	5.6	6.3	11	14	25	12	25	38	47	36	52	47	23	53	76	88	148	259
61.02	5.1	6.1	11	14	26	13	26	40	48	37	54	49	24	54	78	90	150	262
62.99	5.3	6.3	11	14	27	14	27	42	49	38	55	51	25	56	80	93	153	266
64.96	5.4	6.6	12	15	28	15	28	43	51	39	57	53	26	57	83	95	156	269
66.93	5.6	6.8	12	15	29	16	29	44	52	40	59	55	27	58	85	97	159	273
68.90	5.8	7.0	13	16	30	17	30	45	53	41	61	57	28	60	87	99	161	277
70.87	5.9	7.2	14	17	31	18	31	47	56	43	64	59	30	61	89	101	164	280
72.83	-	7.4	14	17	32	19	32	49	59	45	65	63	31	63	91	104	166	283
74.80	-	7.6	15	18	33	20	33	52	61	47	68	68	33	64	93	106	169	287
76.77	-	7.8	16	19	34	21	34	54	62	48	69	72	36	65	95	108	171	291
78.74	-	8.0	17	20	35	22	35	56	64	49	70	76	38	66	97	110	173	294

Note: The oil quantities shown above are valid for standard lagged Motorized Pulleys. For special options (e.g. certain types of special lagging, high duty cycle applications, etc) oil quantities may vary. Therefore, always refer to oil quantity listed on motor data plate or contact Rulmeca.

Technical Precautions for Design, Installation and Maintenance

32) Oil Quantities in Quarts for Motorized Pulleys in "Special Vertical Shaft" Applications



Note: Motorized Pulley shaft is perpendicular to horizontal plane.

Model	Oil Quantity Quarts	Specifications
138E	1.5	Electrical connection to be located at the top
165E	3.2	
220M	10.6	
220H	10.6	
320L	26.4	
320M	26.4	
320H	26.4	
400L	42.3	

Note:
The oil quantities shown are valid for standard vertical Motorized Pulleys. For special options (e.g. certain types of lagging, high duty cycle applications, etc) oil quantities may vary. Therefore, always refer to oil quantity listed on motor data plate.

32) Oil Quantities for "Special Inclined Shaft" Motorized Pulleys - Contact Rulmeca

Note: Motorized Pulley shaft is inclined more than 5 degrees above horizontal plane.

Model	Inclination Angle (α)	Typical applications	Precautions
138E & 165E 220M & 220H 320L, 320M & 320H 400L	5 to 90	Magnetic Separators and Induction Conveyors	Special design & special oil quantity. Contact Rulmeca before placing order.

33) Oil Specifications

Motorized Pulley Model and Type of Oil	Motor Insulation	Allowable Ambient Class	ISO 3498 Viscosity Temperature[1]	DIN 51517-3 Performance Grade[4]	Castrol Requirements	BP	ESSO	Mobiloil	Shell	Texaco
Ø138-1000 Standard Oil	F	-13 F to +104 F	150	CLP	ALPHA SP 150	ENERGOL GR-XP 150	SPARTAN EP 150	MOBILGEAR 629	OMALA 150	MEROPA 150
Ø138-1000 Synthetic Oil[2]	F	-13 F to +104 F	220	CLP	ALPHA-SYNTH 220	-	SPARTAN Syn. EP 220	SHC 630	-	-
Ø138-1000 Synthetic Oil[2]	H	-13 F to +120 F	220	CLP	ALPHA-SYNTH 220	-	SPARTAN Syn. EP 220	SHC 630	-	-
Ø138-1000 Food Grade Oil[3]	F & H	-22 F to +104 F	220	-	-	-	-	-	Shell Cassida GL220	-

1 Allowable ambient temperature refers to temperature in the vicinity of Motorized Pulley. See Technical Precautions page 79.

2 Synthetic oil is supplied with all Class H motors. It is also available with Class F motors to reduce oil change frequency (see page 86,) reduce gear wear, and reduce noise.

3 This oil complies with food additive regulation 12 CPR.

4 ISO Viscosity Grades are shown in centistokes at +104 F. See also ISO 3498 and DIN 31519 for more information.

34) External Connection Diagrams for Standard Motorized Pulleys

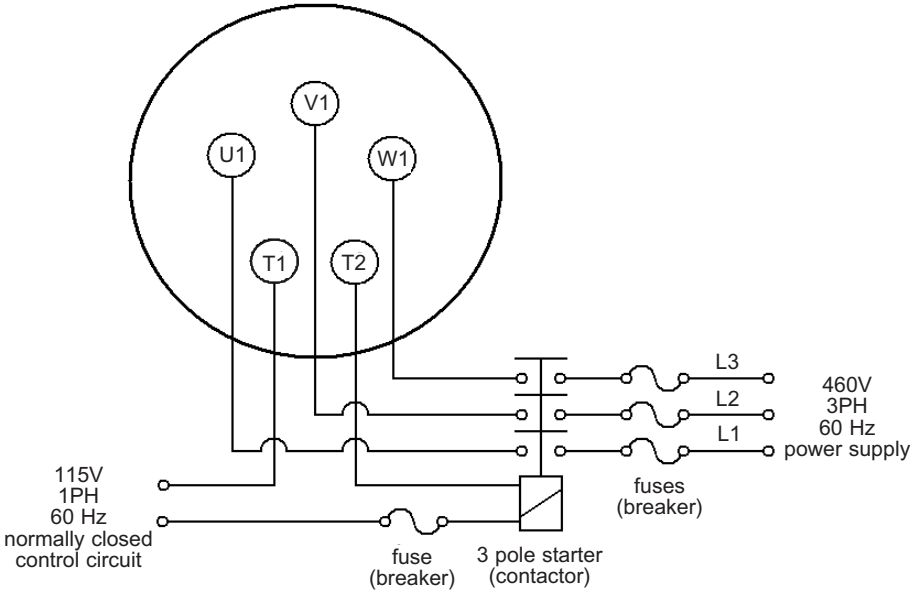
Standard Terminal Box
0.5 HP - 330 HP

Diagrams are valid for Motorized Pulleys manufactured after January 2011. For units built prior to this date contact Rulmeca or refer to Repair and Maintenance Guide available at www.rulmecacorp.com.

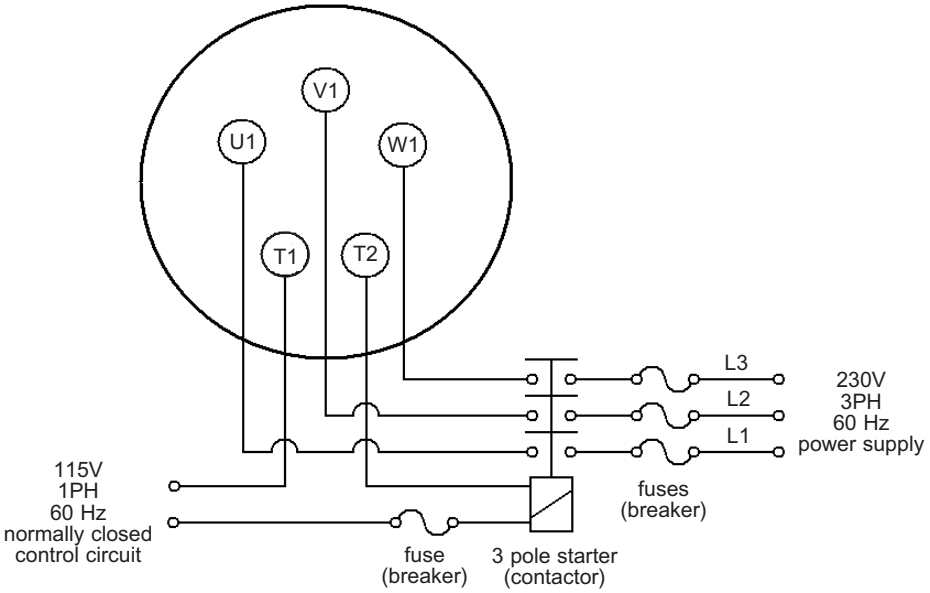
T1 & T2 = Internal bi-metallic thermal protection switch which *MUST BE CONNECTED* to external normally closed control circuit.

See Technical Precautions pages 78 - 88 for complete electrical design, installation, and maintenance instructions.

USA standard 460V power supply



USA standard 230V power supply



34) External Connection Diagrams for Standard Motorized Pulleys with Internal Brake

Standard Terminal Box
0.5 HP - 20 HP

Diagrams are valid for Motorized Pulleys manufactured after January 2011. For units built prior to this date contact Rulmeca or refer to Repair and Maintenance Guide available at www.rulmecacorp.com.

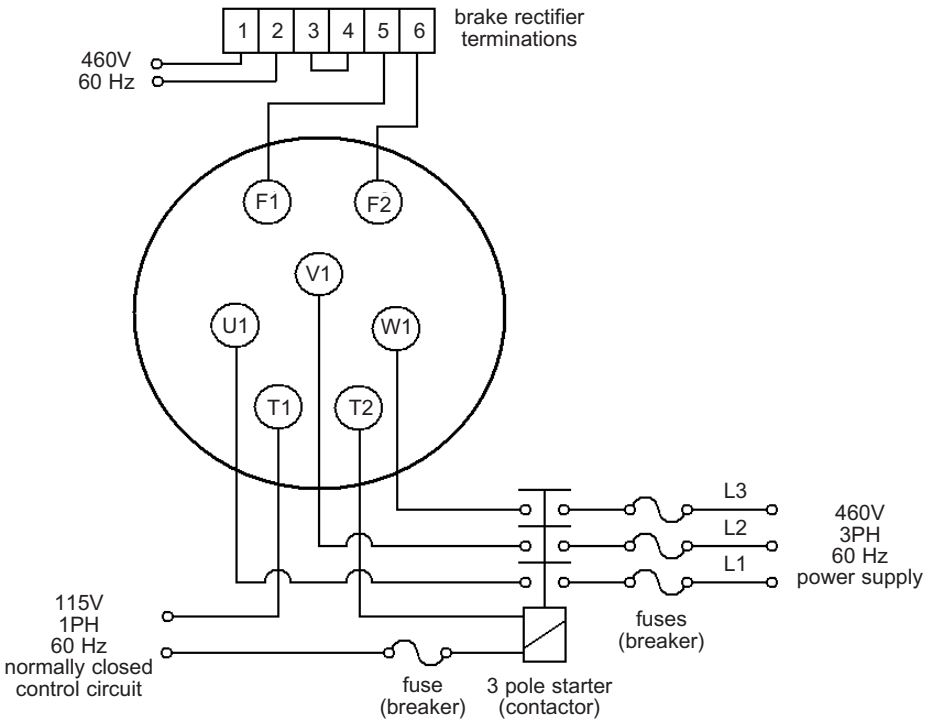
T1 & T2 = Internal bi-metallic thermal protection switch which *MUST BE CONNECTED* to external normally closed control circuit.

See Technical Precautions pages 78 - 88 for complete electrical design, installation, and maintenance instructions.

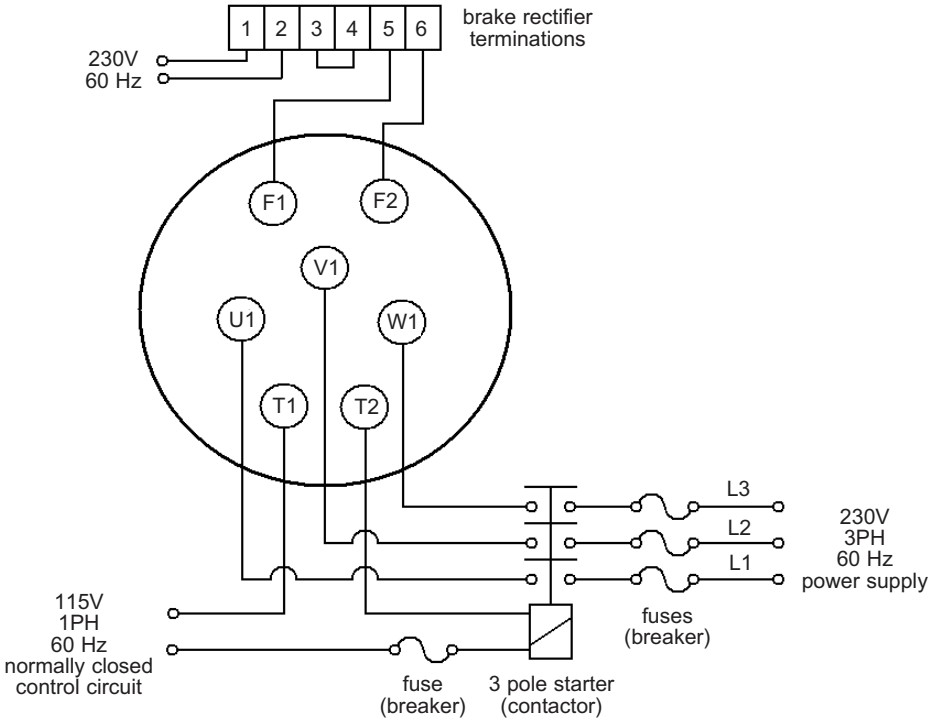
Brake rectifier is shown with jumper across terminals 3 and 4. This enables AC power supply to rectifier to stop and start brake. Brake responsiveness may be improved by connecting an external switch to terminals 3 and 4.

Internal electromagnetic brake is available in models 220M - 500M.

USA standard 460V power supply (with 207VDC brake)



USA standard 230V power supply (with 104VDC brake)



34) Connection Diagrams for Motorized Pulleys

Model 138E - 400L in 3 phase Power Cord 0.13 HP - 5.5 HP

Model 138E in 1 phase Power Cord 0.13 HP - 0.75 HP

Power cord wires are supplied with black insulation and white numbers. Wire numbers are indicated on the diagram.

T1 & T2 = Internal bi-metallic thermal protection switch which *MUST BE CONNECTED* to external normally closed control circuit.

EB = electromagnetic brake

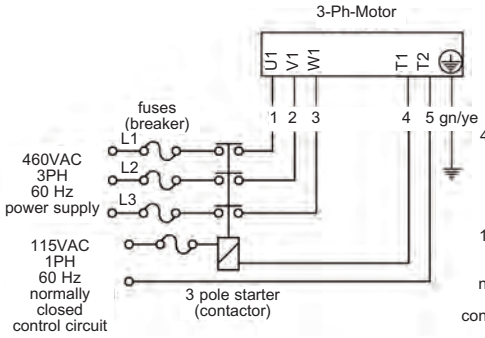
See Technical Precautions pages 78 - 88 for complete electrical design, installation, and maintenance instructions.

Brake rectifier is shown with jumper across terminals 3 and 4. This enables AC power supply to rectifier to stop and start brake. Brake responsiveness may be improved by connecting an external switch to terminals 3 and 4.

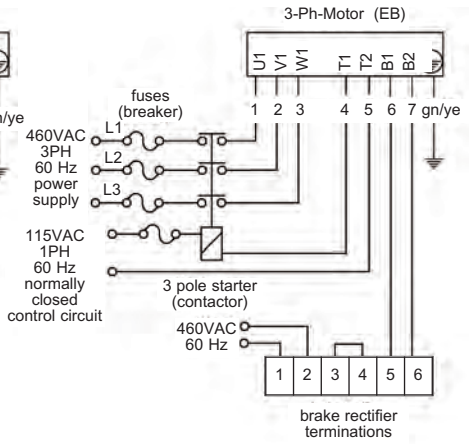
For two speed motor details contact Rulmeca.

Internal electromagnetic brake is available in models 138E - 500M.

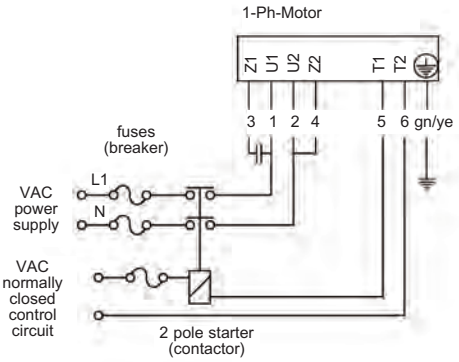
USA standard 460V power supply



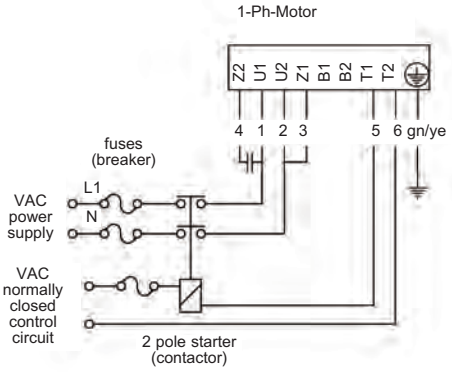
USA standard 460V power supply (with 207VDC brake)



Single Phase power supply (clockwise rotation)



Single Phase power supply (counterclockwise rotation)



34) Connection Diagrams for Motorized Pulleys

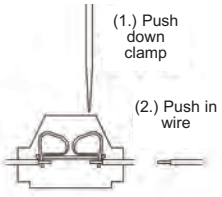
Model 138E in 3 phase Compact Terminal Box and WAGO-Clamp 0.13 HP - 1.0 HP

T1 & T2 = Internal bi-metallic thermal protection switch which *MUST BE CONNECTED* to external normally closed control circuit.

See Technical Precautions pages 78 - 88 for complete electrical design, installation, and maintenance instructions.

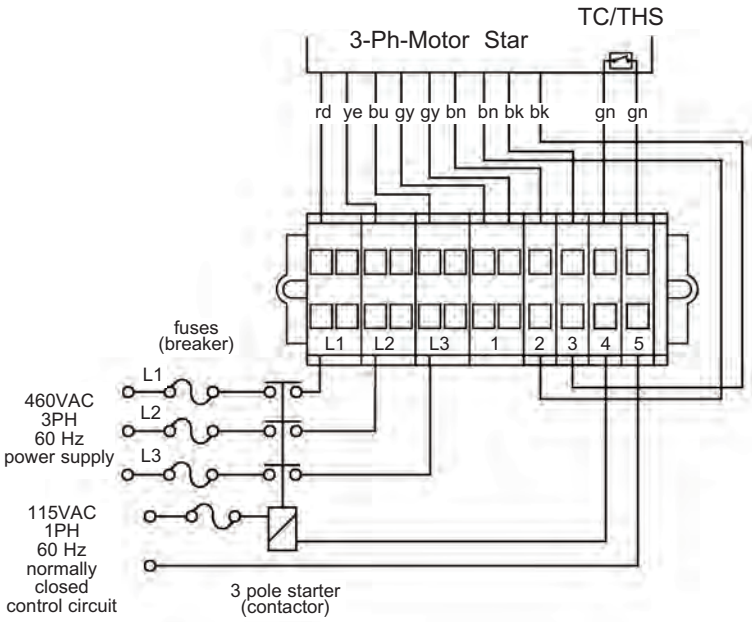
For two speed motor details contact Rulmeca.

RD = Red
YE = Yellow
BK = Black
GY = Grey
BU = Blue
GN = Green
BN = Brown
T1 & T2 = Thermal Protector

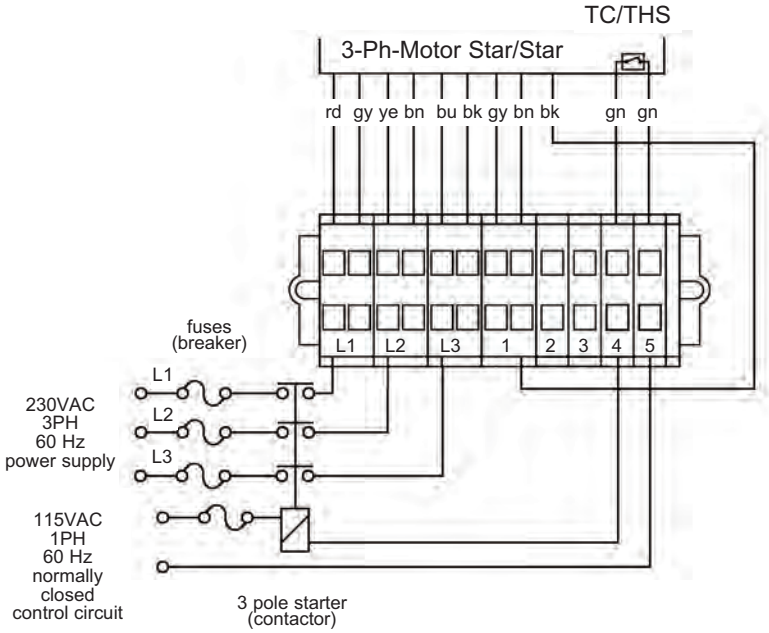


Assembly instructions

USA standard 460V power supply



USA standard 230V power supply



34) Connection Diagrams for Motorized Pulleys

Model 138E in 1 phase Compact Terminal Box and WAGO-Clamp 0.13 HP - 0.75 HP

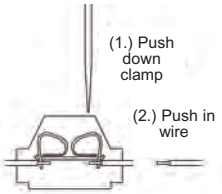
Diagrams are valid for Motorized Pulleys manufactured after January 2011. For units built prior to this date contact Rulmeca or refer to Repair and Maintenance Guide available at www.rulmecacorp.com.

T1 & T2 = Internal bi-metallic thermal protection switch which *MUST BE CONNECTED* to external normally closed control circuit.

See Technical Precautions pages 78 - 88 for complete electrical design, installation, and maintenance instructions.

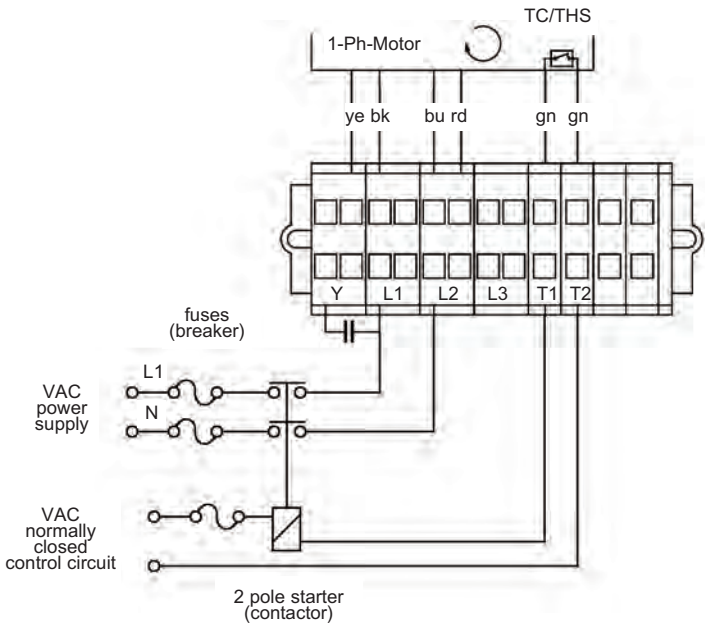
For two speed motor details contact Rulmeca.

RD = Red
YE = Yellow
BK = Black
GY = Grey
BU = Blue
GN = Green
BN = Brown
T1 & T2 = Thermal Protector

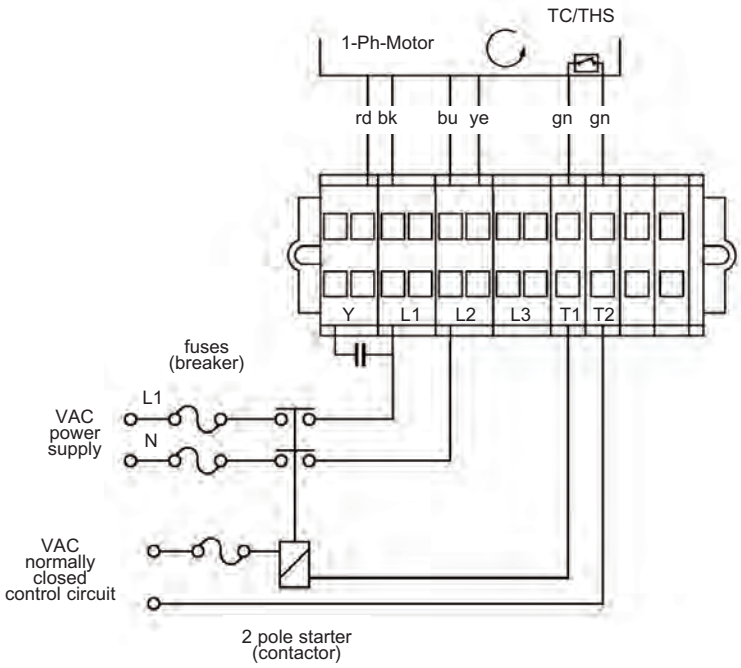


Assembly instructions

Single Phase power supply (clockwise rotation)



Single Phase power supply (counterclockwise rotation)



34) External Connection Diagrams for Standard Motorized Pulleys with and without Internal Brake

Standard Terminal Box w/o brake 0.5 HP - 330 HP

Standard Terminal Box with brake 0.5 HP - 20 HP

Diagrams are valid for Motorized Pulleys manufactured after January 2011. For units built prior to this date contact Rulmeca or refer to Repair and Maintenance Guide available at www.rulmecacorp.com.

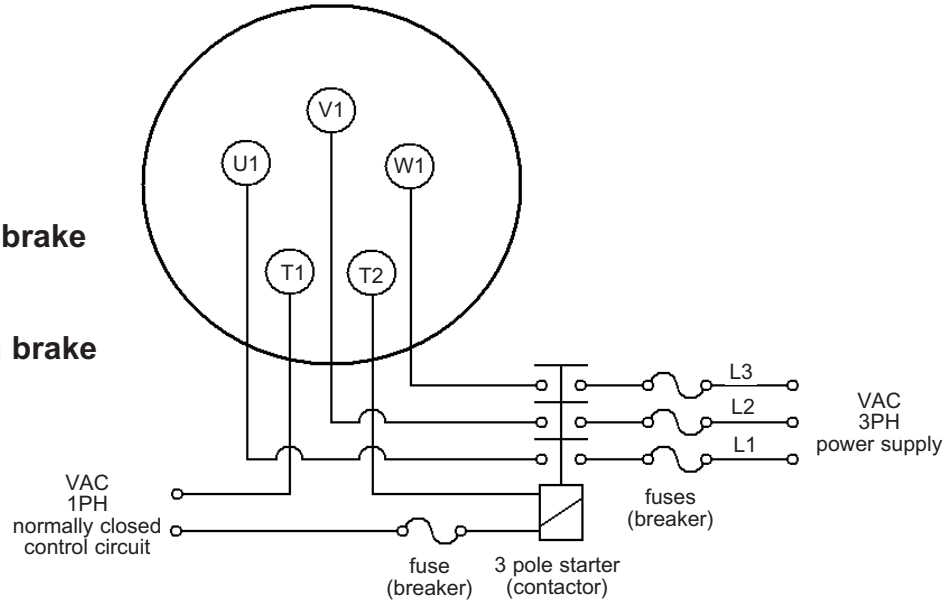
T1 & T2 = Internal bi-metallic thermal protection switch which *MUST BE CONNECTED* to external normally closed control circuit.

See Technical Precautions pages 78 - 88 for complete electrical design, installation, and maintenance instructions.

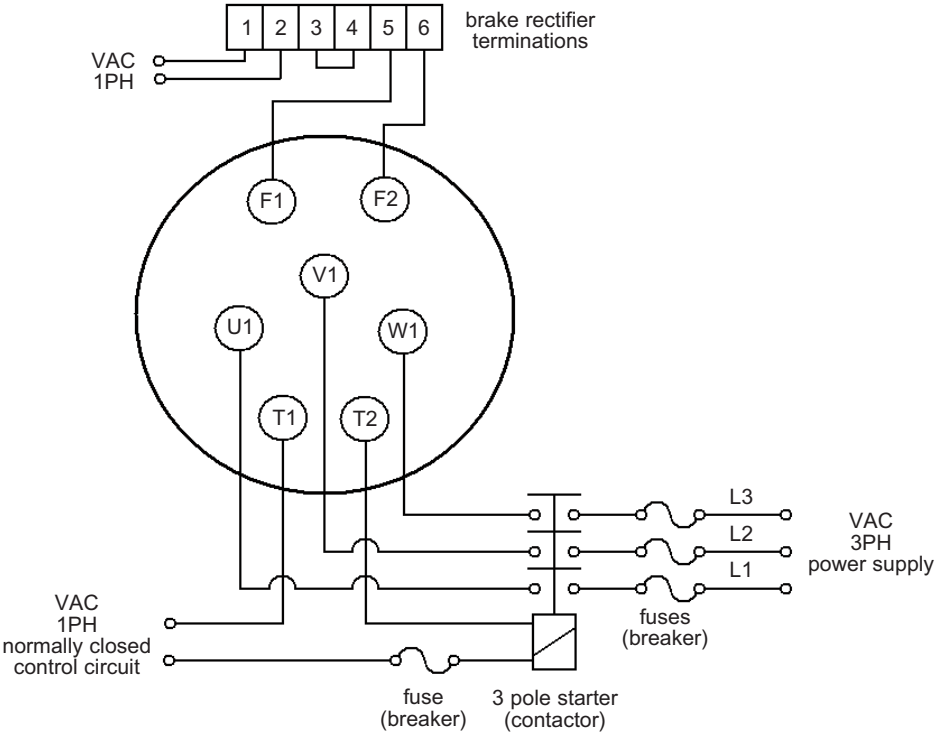
Brake rectifier is shown with jumper across terminals 3 and 4. This enables AC power supply to rectifier to stop and start brake. Brake responsiveness may be improved by connecting an external switch to terminals 3 and 4.

Internal electromagnetic brake is available in models 220M - 500M.

Non-USA power supply without brake



Non-USA power supply with brake



34) External Connection Diagram for Standard Motorized Pulleys 500H - 1000HD with Internal Anti-condensation Heating Element

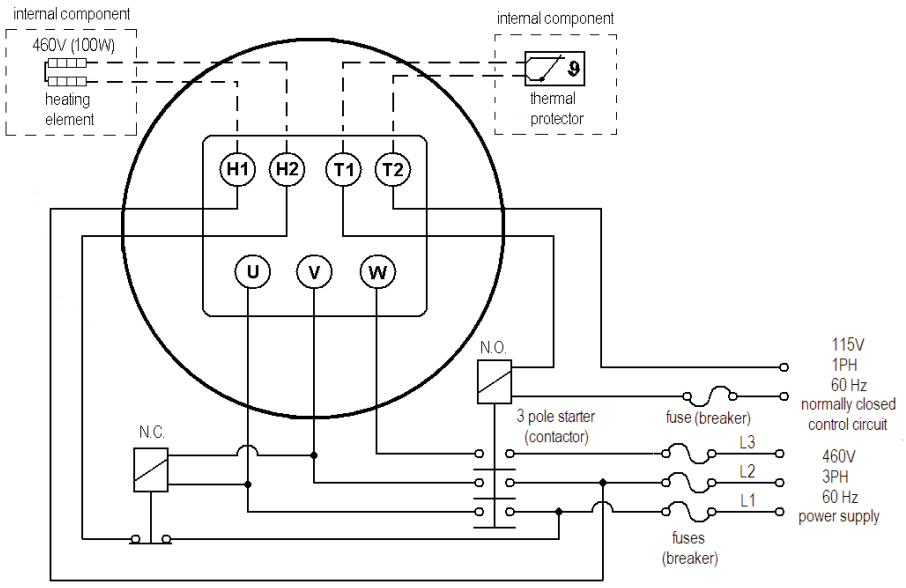
Diagrams are valid for Motorized Pulleys manufactured after January 2004. For units built prior to this date contact Rulmeca or refer to Repair and Maintenance Guide available at www.rulmecacorp.com.

Terminals H1 & H2 for the anti-condensation heating element are live during Motorized Pulley stoppage.

Terminals T1 & T2 for thermal protection switch which *MUST BE CONNECTED* to external normally closed control circuit.

See Technical Precautions pages 78 - 88 for complete electrical design, installation, and maintenance instructions.

USA standard 460V power supply



Anti-condensation heating element must be connected in such a way that it is turned off during motor operation.

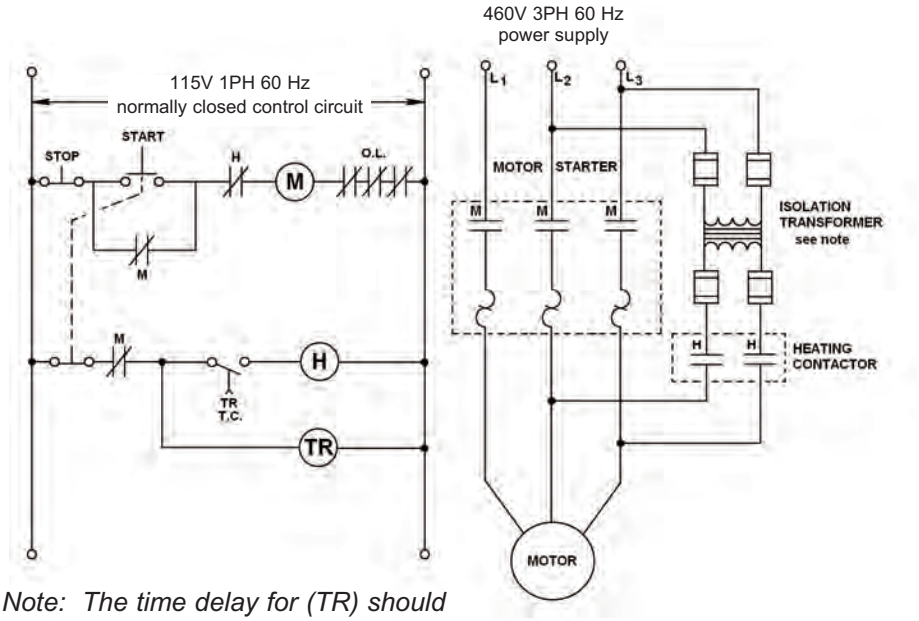
34) External Connection Diagram for Standard Motorized Pulleys 500H - 1000HD with Trickle Voltage Heating

Diagrams are valid for Motorized Pulleys manufactured after January 2004. For units built prior to this date contact Rulmeca or refer to Repair and Maintenance Guide available at www.rulmecacorp.com.

T1 & T2 = Internal bi-metallic thermal protection switch which *MUST BE CONNECTED* to external normally closed control circuit.

See Technical Precautions pages 78 - 88 for complete electrical design, installation, and maintenance instructions.

USA standard 460V power supply



Note: The time delay for (TR) should be between 10 and 180 seconds.

NOTES

NOTES

Summary of Optional Extras - Motorized Pulleys 138E - 1000HD

Specification \ Model	138E	165E	220M & 220H	320L	320M & 320H	400L	400M & 400H	500L & 500M	500H	630M	630H	800M	800H	800HD	1000HD
Total stainless steel (AISI 304 range) with regreasable labyrinth seals	TS7N	TS7N	TS9N	TS9N	TS9N	TS9N	TS9N	-	-	-	-	-	-	-	-
Total stainless steel (AISI 304 range) with standard seals	-	-	TS10N	TS10N	TS10N	TS10N	TS10N	-	-	-	-	-	-	-	-
Total stainless steel (AISI 316 range) with regreasable labyrinth seals	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-
Total stainless steel (AISI 316 range) with standard seals	-	-	x	x	x	x	x	-	-	-	-	-	-	-	-
Semi-rust free with regreasable labyrinth seals	-	-	TS11N	TS11N	TS11N	TS11N	TS11N	TS11	TS11	TS11	TS11	TS11	TS11	TS11	TS11
Semi-rust free with standard seals	-	-	TS12N	TS12N	TS12N	TS12N	TS12N	TS12	TS12	TS12	TS12	TS12	TS12	TS12	-
Regreasable labyrinth seals (with carbon steel tube and shafts)	-	-	x	x	x	x	x	x	x	x	x	x	x	x	Std
Food grade oil & grease (FDA & USDA recognized)	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-
Dust explosion proof certification ATEX 95 Class II Zone 22 atmosphere (EU Directive 94/9EC article 8)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Black rubber lagging, standard specification, cold-bonded diamond pattern, hardness 60 +/- 5 shore A	1/8"	1/8"	1/4"	5/16"	5/16", 1/4"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	-
Black rubber lagging, standard specification, cold-bonded smooth pattern, hardness 60 +/- 5 shore A	1/8"	1/8"	1/4"	5/16"	5/16", 1/4"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	-
White rubber lagging, standard specification, cold-bonded smooth pattern, oil/fat/grease resistant	o	o	o	o	o	o	o	-	-	-	-	-	-	-	-
Special rubber lagging [e.g. hot vulcanized bond, ceramic segments, ceramic blocks (in rubber)]	o	o	o	o	o	o	o	o	o	o	o	o	o	o	-
Solid ceramic lagging	-	-	-	-	-	-	-	-	x	x	x	x	x	x	Std
Electromagnetic brake	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-
Mechanical backstop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
External brake shaft (for mechanical brake by others)	-	-	-	-	-	-	-	-	500H	x	x	x	x	x	x
Modified for vertical mounting	o	o	o	o	o	o	o	-	-	-	-	-	-	-	-
Modified for mounting between 5° and 90° (e.g. for magnetic separators)	o	o	o	o	o	o	o	-	-	-	-	-	-	-	-
Motor insulation class H with synthetic oil (allowable ambient temperature -13°F/+120°F)	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std
Motor insulation class F with standard oil (allowable ambient temperature -13°F/+104°F	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-
Special motors for applications with no belt contact	o	o	o	o	o	o	o	-	-	-	-	-	-	-	-
Low noise drives for noise-sensitive areas	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-
Parallel shell (i.e. no crown)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Yellow powder coated cast iron terminal box	-	-	-	-	-	-	Std	Std	Std	Std	Std	Std	Std	Std	Std
Yellow powder coated aluminum terminal box	-	-	Std	Std	Std	Std	-	-	-	-	-	-	-	-	-
Gray powder coated aluminum terminal box (food grade approved)	-	-	x	x	x	x	-	-	-	-	-	-	-	-	-
Compact powder coated aluminum terminal box (food grade approved) ≤ 5.5 HP only	-	-	o	o	o	-	-	-	-	-	-	-	-	-	-
Compact unpainted aluminum terminal box ≤ 5.5 HP only	Std	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Compact stainless steel terminal box (food grade approved) (AISI 304 or 316 range) ≤ 5.5 HP only	x	x	o	o	o	-	-	-	-	-	-	-	-	-	-
Straight or elbow connector with standard power cord ≤ 5.5 HP only	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-
Straight connector with screened power cord (See pg 88 for VFD precautions) ≤ 5.5 HP only	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-
Straight connector with standard power cord (Stainless steel in AISI 304 range) ≤ 5.5 HP only	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-
Voltage: single voltage (460) stator (Y winding) wired for 460v/3ph/60 Hz at terminal box	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std	Std
Special voltage motors (e.g. 1000v)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Single phase motors	o	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSA approved motors	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

x = optional extras; **o** = option with certain limitations (Refer to Technical Precautions pages 78 to 98); **Std** = supplied as standard; **-** = not available

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