



Engineered to Keep Your Business Running

TM315 - TM500 DRUM MOTORS

12.5" to 20.0" diameter • 1.5 to 40 hp

HEAVY-DUTY

BELT PULL (BP) = (F0 + F1 + F2)

Roller Bed Conveyor

$F0 = 0.04 (2P + Q) L$

$F1 = 0.04 \times R \times L$

$F2 = R \times H$

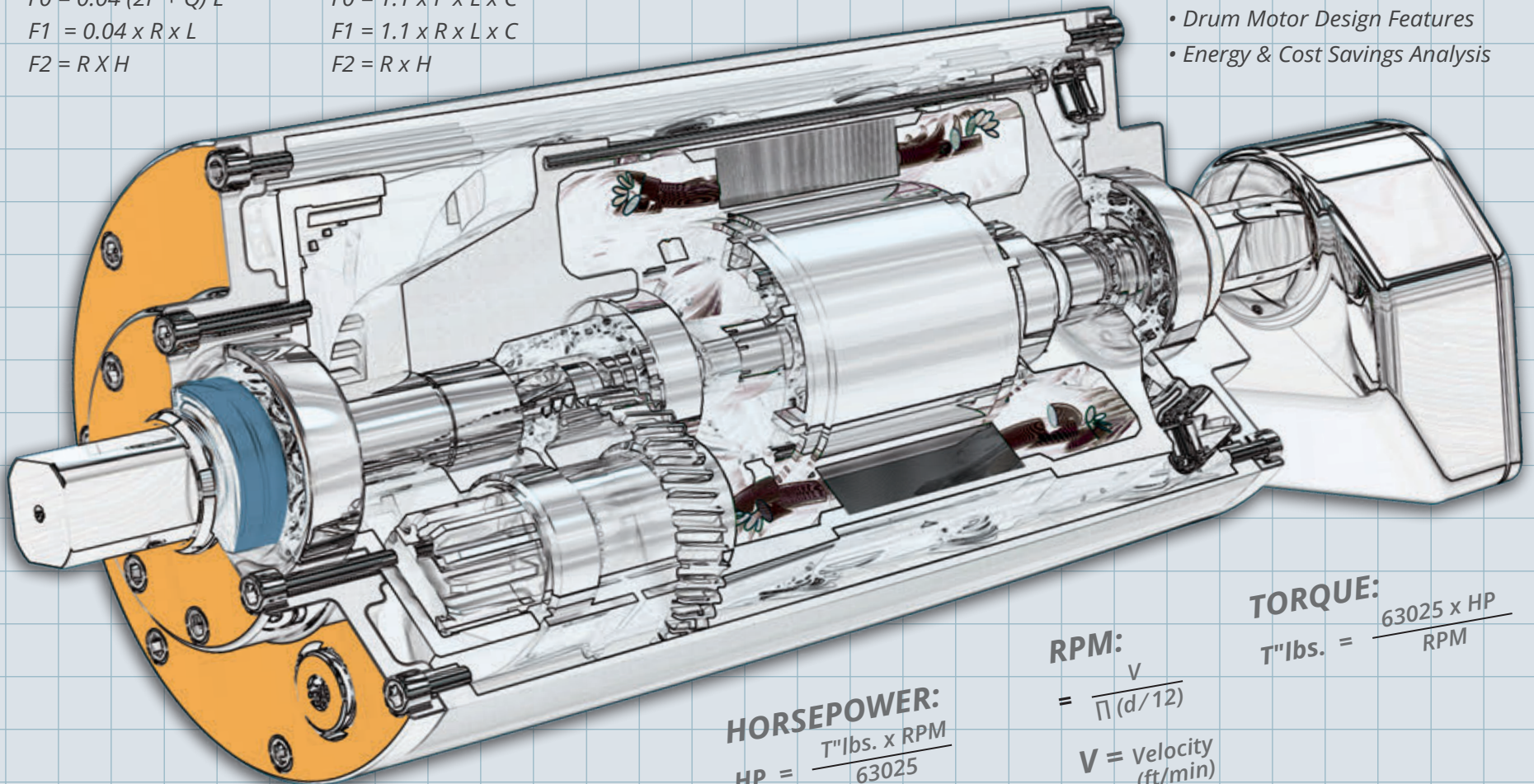
Slider Bed Conveyor

$F0 = 1.1 \times P \times L \times C$

$F1 = 1.1 \times R \times L \times C$

$F2 = R \times H$

- Dimensions & Specifications
- Cross Sectional Drawings
- Electric Motor Full Load AMP Chart
- Drum Motor Design Features
- Energy & Cost Savings Analysis



HORSEPOWER:
 $HP = \frac{T''\text{lbs.} \times \text{RPM}}{63025}$

RPM:
 $= \frac{V}{\pi(d/12)}$

V = Velocity
 (ft/min)

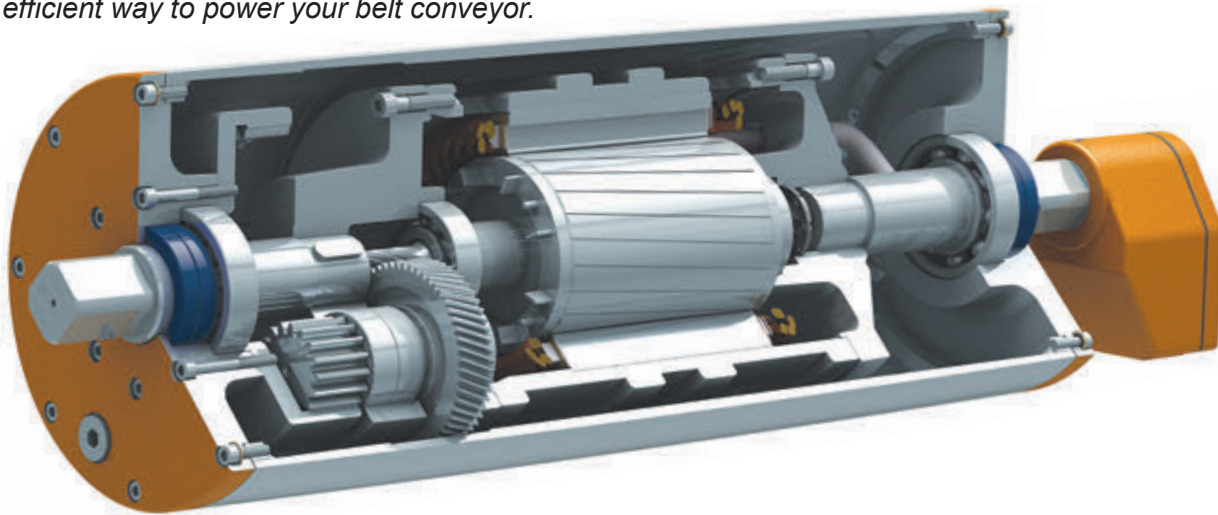
TORQUE:
 $T''\text{lbs.} = \frac{63025 \times \text{HP}}{\text{RPM}}$

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The Van der Graaf Drum Motor is a one component conveyor drive which houses all components internally, eliminating the need for external components like motor, gearbox, sprockets, chain, chain guard and pillow block bearings. This reduces operating and maintenance costs, improves safety conditions, and because it is completely sealed our drum motors can operate in extreme environmental conditions.

The rugged design of the Van der Graaf drum motor provides the end user with a quieter environment, space savings, efficiency and reliability with virtually no maintenance.

The drum motor offers a versatile, less complex and more efficient way to power your belt conveyor.



Standard drum motors are available in a wide range of diameter sizes, belt speeds, horsepower and face widths. The electric motor is available in all standard voltage and frequency suitable for most applications.



INCREASE OPERATOR SAFETY

All external moving parts such as gearbox, chains, motor, chain guard and pillow block bearings that present safety hazards are eliminated.

LOWER ENERGY COSTS

Van der Graaf drum motors operate at 96% mechanical efficiency resulting in lower operating cost compared to conventional drives. The higher efficiency of the internal drive can result in energy savings* of up to 30% over conventional exposed-drive conveyors.

REDUCE NOISE LEVELS

Our gears are manufactured using high quality alloy steel, teeth cut and honed to AGMA/DIN 6 standards, reducing noise to minimal decibel levels which exceeds OSHA requirements for noise.

REDUCE MAINTENANCE & DOWNTIME

The drum motor being completely sealed with no external moving components, eliminates the need for continual chain adjustment and yearly maintenance. Our motors are virtually maintenance free, requiring only an oil change after 50,000 hours of operation which can be performed without removing the drum motor from the conveyor.

ENHANCE SPACE UTILIZATION

Low profile of the drum motor results in a streamline appearance and allows to fit more belt conveyor into less floor or overhead space. Allows higher density and multiple applications.

**Energy and Cost Savings Analysis - page 5-6.*

CAST IRON COMPONENTS

Every Van der Graaf Drum Motor utilizes cast-iron gear housing and motor flanges. By choosing cast-iron over lighter cast-aluminum components, the Van der Graaf Drum Motor is able to withstand greater levels of belt tension over typical motorized pulley designs.

CONSTRUCTION MATERIAL

Drum motors are available in all mild steel and optional all stainless steel construction (see Drum Motors Options).

COOLING

The drum motor is designed with all vital components, such as motor and gear reducer rotating in an oil bath, sealed and isolated from the environment. Temperature generated from the motor and gear reducer is transferred through the oil to the drum and dissipates on the belt.

ELECTRIC MOTORS

All Van der Graaf electric motors are manufactured to inverter duty standards.

Insulation

All material used for the electric motor windings meet Class F standards (155°C). The optional Class H standards (180°C) is required for applications with ambient temperature of 125°F and higher.

Vacuum Pressure Impregnation (VPI)

One of the high longevity contributors to the electric motor is the method of encapsulation. The highest industry standards for electric motor encapsulation is through a process call **Vacuum Pressure Impregnation (VPI)**. This state of the art method is only used in less than 10% of world's standard electric motor production and is primarily applied on extreme heavy duty applications. Van der Graaf has adopted the VPI method as standard to all of our products. This process has helped the end-user to reduce electric motor failures substantially.

Supply Voltage

The drum motor can be supplied in all standard voltage and all other nonstandard voltage and frequency for three phase or single phase applications.

HERMETIC SEALING

The drum motor incorporates high quality seals to ensure an oil leak free unit. Seals rotate on a hardened bushing to preserve seal life and extend durability. All Van der Graaf drum motors use a bolt-on design utilizing gaskets or O-rings.

HUB DESIGN:

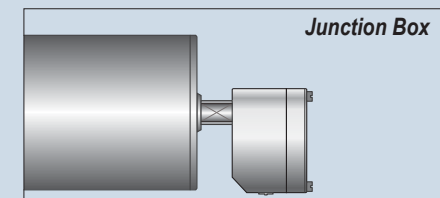
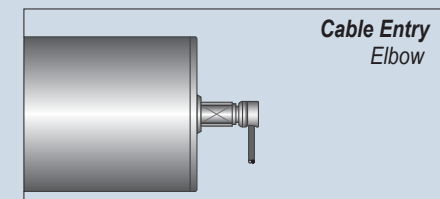
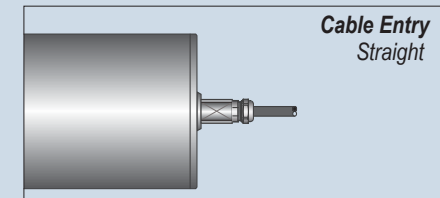
Design A: *Bearing hubs extend beyond the shell*



Design B: *Bearing hubs are recessed to accommodate narrower conveyor frames while maintaining the same face width.*



POWER HOOK-UP:



ALL STAINLESS STEEL

All units are available in all stainless steel construction, including end caps, shell, shafts and junction box.

NON-STANDARD LENGTH / EXTRA LONG FACE WIDTH

Please contact your Van der Graaf technical representative for details.

GV THERMAL (GVTHERM) OVERLOAD PROTECTION

Thermal overload protectors are devices, embedded into the motor windings (one per phase) and are available for both Class F and H insulation. These are bi-metal type devices, maintaining continuity under normal temperature conditions. When temperature within the motor rises above 135°C for Class F and 165°C for Class H, the GVTHERM will trip, causing an open circuit between the respective GVTHERM leads.

NO BELT (NB) OPERATION

No Belt design series drum motor is recommended for applications when the drum motor is required to run without a belt or using modular belting.

The NB series drum motor should be specified when:

- a) the conveyor belt covers less than two thirds of the overall face width
- b) modular sprockets are attached to power modular belting
- c) no conveyor belt is used

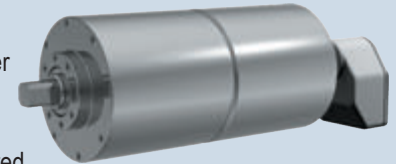
Please contact your Van der Graaf representative for application assistance.

CLASS H INSULATION

The optional Class H standards (180°C) is required for applications with ambient temperature of 125°F and higher. By providing a higher insulation Class, the electric motor is able to withstand a higher ambient operating temperature.

SHELL (DRUM):

The shell of the Van der Graaf drum motor is machined to convex crown approximately 1% of the diameter in order to help track the belt more accurately. Other crown profiles such as trapezoidal or flat face are available.



V-Grooves - V-Grooves are available on all Van der Graaf drum motors. The v-groove is machined into the shell for optimal tracking; single or multiple v-groove locations are available. If lagging is required then a 1/4" maximum thickness is available to minimize chance of v-guide climb out.

Tungsten Carbide: Molten tungsten particles are embedded into the surface of the shell using a thermo spray system resulting in a straight hard-faced coating from 65-68 Rc hardness. The finish has excellent wear resistance with a surface textures from 600 to 800 RMS and typical thickness of 0.006-0.10 inches. Drum motor with the tungsten carbide option is highly recommended in slider bed conveyor applications in order to substantially improve belt traction without increasing the coefficient of friction.

On a slider bed conveyor where the head pulley does not have the tungsten carbide finish on the shell, is lagged with rubber for traction. Due to the constant wear of the rubber lagging, the rubber dust accumulates between the belt and the slider bed. This causes the coefficient of friction to increase on the belt, resulting in higher energy consumption. Since the rubber lagging on the head pulley does not wear evenly on the face of the pulley, it causes the loss of the crown resulting to belt mistracking. The drum motor with the tungsten carbide option maintains the crown profile due to the hard surface, improves belt traction up to 40% and will not increase the coefficient of friction since there is no rubber lagging to wear off.

Lagging - Van der Graaf offers a complete line of 'hot bond' and urethane laggings.

Hot Bond lagging: is a vulcanization process that cures rubber, wrapped to the desired thickness around the shell of the drum motor, under high-pressure and high-temperature. The result is a seamless, durable and tear resistant lagging.

Urethane lagging: is a two part ribbon flow cast method which pours liquid urethane directly on the shell. The shell finish prior to urethane lagging is prepared by a patented spiral groove to lock the urethane to the shell.

Various thickness and finishes are available:

Smooth, Diamond and Chevron; in 1/8", 3/16", 1/4", 3/8", 1/2", 3/4" and 1" thickness.

Non-standard thickness requirements are available upon request.

ELECTROMAGNETIC BRAKE (RTM)

The drum motor with an all-internal electromagnetic brake provides accurate and positive stopping engagement. The motor and all rotating components come to a complete stop when power is disengaged. When power is engaged, the brake releases, allowing the motor to operate as designed. The RTM drum motor is bi-directional and ideal for cycles up to 40 starts and stops per minute. Typical applications include baggage handling, manufacturing and assembly lines, palletizing and package operations, among others.

CLUTCH BRAKE (CBTM)

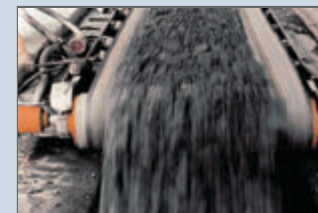
The patented Clutch Brake Drum Motor provides maintenance-free operation in high indexing conveyor applications, up to 80 starts and stops per minute. The clutch brake allows the internal motor to run continuously and engages the drum only when conveyor movement is desired.

A drum motor equipped with the clutch brake eliminates the in-rush current that is a common cause of overheating the electric motor. Disengaging the clutch module allows the motor to continue running while the drum is stopped. The drive motor and clutch brake components are all housed within the drum and are bathed in oil.

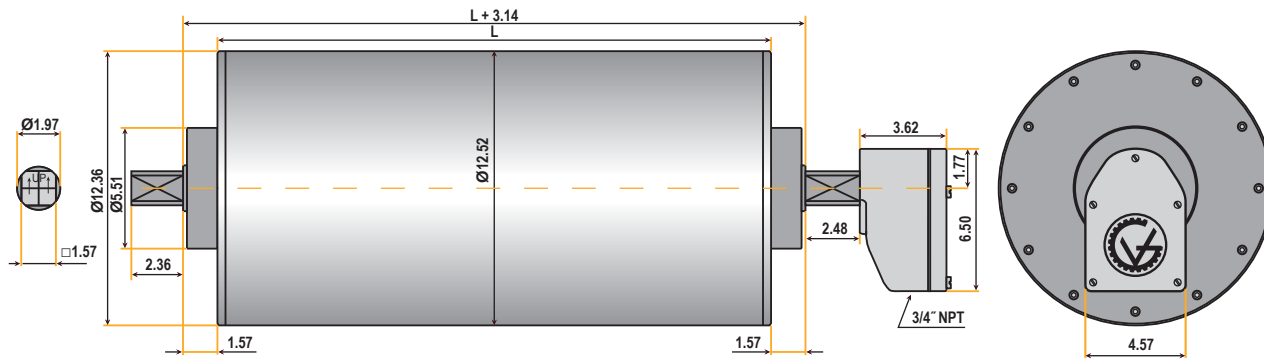
MANUAL RELEASE BACKSTOP (MRB)

The patented Manual Release Backstop reduces the time and physical effort needed to reverse inclined conveyor direction. The MRB device has the ability to disengage an internal backstop allowing the drum motor drive to move freely in the reverse direction so that the belt can be unloaded. Drum motors with the MRB device can be implemented on both new and existing inclined conveyors.

Incline conveyors are designed to operate in the upward direction. However, at times it may be necessary to unload the conveyor belt, i.e. power outages, downstream backups or jams, etc. The MRB can be easily disengaged allowing the belt to roll back for easy unloading.



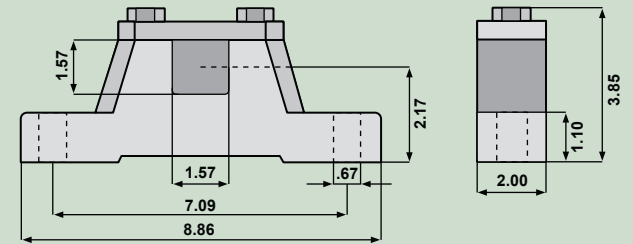
TM315A50 Drum Motor (matching Idler KT315A50)**



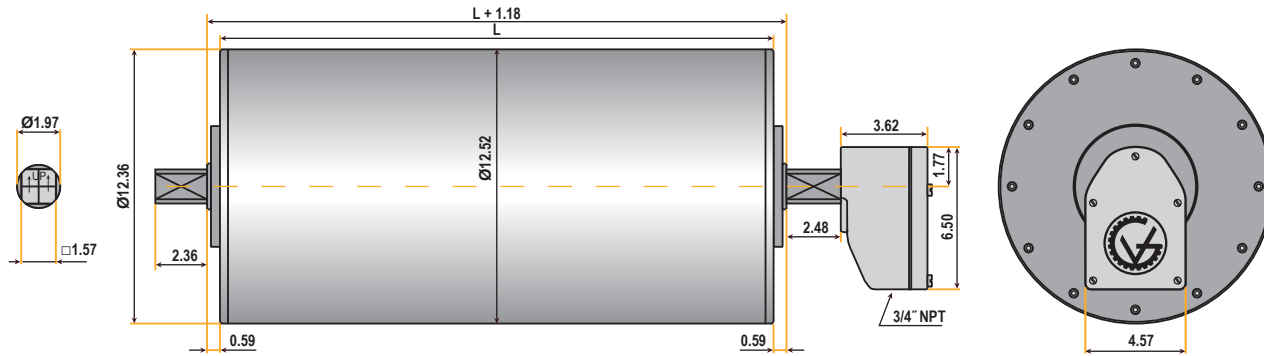
Standard face widths* (L) in inches:

19.69	21.65	23.62	25.59	27.56	29.53	31.50	33.46	35.43
37.40	39.37	41.34	43.31	45.28	47.24	49.21	51.18	53.15
55.12								

Bracket AB 50



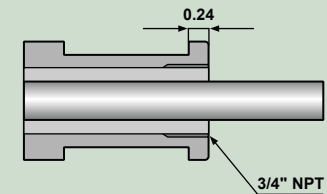
TM315B50 Drum Motor (matching Idler KT315B50)**



Standard face widths* (L) in inches:

21.65	23.62	25.59	27.56	29.53	31.50	33.46	35.43	37.40
39.37	41.34	43.31	45.28	47.24	49.21	51.18	53.15	55.12

Optional Cable Type



Note: When Optional Cable Type is selected, the minimum face width (L) increases by 1.969 inches.

*Some face widths are not available in all horsepower. For minimum available face widths refer to TM315 Specifications.

**Idler dimensions are identical to the drum motor with no junction box.

TM315 SERIES (12.5" diameter)



SPECIFICATIONS

TM315 - 215 (15.0 HP 3400 RPM)				Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59"								WEIGHT = 310.00 LBS. @ L=23.62"							
V (ft/min)	1039	898	803	709	661	590	567	520	449	378									
NLV (ft/min)	1091	943	843	745	694	620	595	546	472	397									
BP (lbs)	444	514	575	651	697	781	814	888	1028	1221									
T' lbs.	229	265	296	335	359	402	419	457	529	629									
WITH 0.25" LAGGING																			
V (ft/min)	1081	934	835	737	687	613	589	541	467	391									
NLV (ft/min)	1134	980	876	774	721	644	618	567	490	412									
BP (lbs)	435	504	564	638	683	766	798	870	1008	1197									
T' lbs.	229	265	296	335	359	402	419	457	529	629									
TM315 - 410 (10.0 HP 1740 RPM)				Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59"								WEIGHT = 299.80 LBS. @ L=23.62"							
V (ft/min)	964	790	712	571	524	507	447	390	337	310	290	268	243	223	183	169	146		
NLV (ft/min)	1013	830	748	600	550	533	470	410	354	326	304	282	255	234	192	177	153		
BP (lbs)	343	418	464	579	631	652	739	846	980	1064	1140	1232	1362	1484	1805	1960	2270		
T' lbs.	179	218	242	302	329	340	385	441	511	554	594	642	710	773	941	1022	1183		
WITH 0.25" LAGGING																			
V (ft/min)	1003	822	740	594	544	527	465	406	351	323	301	279	252	231	190	175	151		
NLV (ft/min)	1054	863	778	624	572	554	488	427	368	339	316	293	265	243	200	184	159		
BP (lbs)	329	402	446	556	607	627	711	814	942	1023	1097	1185	1309	1427	1736	1885	2182		
T' lbs.	179	218	242	302	329	340	385	441	511	554	594	642	710	773	941	1022	1183		
TM315 - 475 (7.5 HP 1740 RPM)				Minimum Face Width (L): DESIGN A = 21.65" DESIGN B = 23.62"								WEIGHT = 292.80 LBS. @ L=23.62"							
V (ft/min)	964	790	712	571	524	507	447	390	337	310	290	268	243	223	183	169	146	133	
NLV (ft/min)	1013	830	748	600	550	533	470	410	354	326	304	282	255	234	192	177	153	140	
BP (lbs)	257	314	348	434	473	489	554	634	735	798	855	924	1021	1113	1354	1470	1702	1857	
T' lbs.	134	163	181	226	247	255	289	331	383	416	446	482	532	580	706	766	887	968	
<i>Continued ...</i>																			
V (ft/min)	121																		
NLV (ft/min)	127																		
BP (lbs)	2050																		
T' lbs.	1069																		
WITH 0.25" LAGGING																			
V (ft/min)	1003	822	740	594	544	527	465	406	351	323	301	279	252	231	190	175	151	139	
NLV (ft/min)	1054	863	778	624	572	554	488	427	368	339	316	293	265	243	200	184	159	146	
BP (lbs)	247	302	335	417	455	470	533	610	707	767	822	889	982	1070	1302	1414	1637	1786	
T' lbs.	134	163	181	226	247	255	289	331	383	416	446	482	532	580	706	766	887	968	

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 3.92 lbs. per inch above 23.62 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.

TM315 SERIES (12.5" diameter)



SPECIFICATIONS

Continued ... TM315 - 475 (0.75 HP 1740 RPM) with 0.25" Lagging

V (ft/min)	126
NLV (ft/min)	132
BP (lbs)	1972
T' lbs.	1069

TM315 - 455 (5.5 HP 1740 RPM)	Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 291.00 LBS. @ L=23.62"																	
V (ft/min)	964	790	712	571	524	507	447	390	337	310	290	268	243	223	183	169	146	133
NLV (ft/min)	1013	830	748	600	550	533	470	410	354	326	304	282	255	234	192	177	153	140
BP (lbs)	188	230	255	318	347	358	407	465	539	585	627	678	749	816	993	1078	1248	1362
T' lbs.	98	120	133	166	181	187	212	243	281	305	327	353	390	425	517	562	650	710

Continued ...

V (ft/min)	121
NLV (ft/min)	127
BP (lbs)	1504
T' lbs.	784

WITH 0.25" LAGGING

V (ft/min)	1003	822	740	594	544	527	465	406	351	323	301	279	252	231	190	175	151	139
NLV (ft/min)	1054	863	778	624	572	554	488	427	368	339	316	293	265	243	200	184	159	146
BP (lbs)	181	221	245	306	334	345	391	448	518	563	603	652	720	785	955	1037	1200	1309
T' lbs.	98	120	133	166	181	187	212	243	281	305	327	353	390	425	517	562	650	710

Continued ...

V (ft/min)	126
NLV (ft/min)	132
BP (lbs)	1446
T' lbs.	784

TM315 - 650 (5.0 HP 1125 RPM)	Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 291.00 LBS. @ L=23.62"																	
V (ft/min)	643	527	475	381	349	286	258	207	162	122	112	97	89	81				
NLV (ft/min)	675	553	499	400	367	300	271	217	170	128	118	102	93	85				
BP (lbs)	257	314	348	434	473	578	641	799	1021	1354	1470	1702	1857	2050				
T' lbs.	134	163	181	226	247	301	334	417	532	706	766	887	968	1069				

WITH 0.25" LAGGING

V (ft/min)	669	548	494	396	363	297	268	215	168	127	117	101	92	84				
NLV (ft/min)	702	575	519	416	381	312	281	226	177	133	123	106	97	88				
BP (lbs)	247	302	335	417	455	555	616	769	982	1302	1414	1637	1786	1972				
T' lbs.	134	163	181	226	247	301	334	417	532	706	766	887	968	1069				

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 3.92 lbs. per inch above 23.62 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.

TM315 SERIES (12.5" diameter)



SPECIFICATIONS

TM315 - 440 (4.0 HP 1740 RPM)		Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 282.20 LBS. @ L=23.62"												
V (ft/min)	524	429	387	310	243	183	169	146	133	121				
NLV (ft/min)	550	451	406	326	255	192	177	153	140	127				
BP (lbs)	252	308	342	426	545	722	784	908	990	1093				
T' lbs.	132	161	178	222	284	376	409	473	516	570				
WITH 0.25" LAGGING														
V (ft/min)	544	446	402	322	252	190	175	151	139	126				
NLV (ft/min)	572	469	422	339	265	200	184	159	146	132				
BP (lbs)	243	296	329	410	524	694	754	873	952	1051				
T' lbs.	132	161	178	222	284	376	409	473	516	570				
TM315 - 640 (4.0 HP 1125 RPM)		Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 291.00 LBS. @ L=23.62"												
V (ft/min)	643	527	475	381	349	286	258	207	162	122	112	97	89	81
NLV (ft/min)	675	553	499	400	367	300	271	217	170	128	118	102	93	85
BP (lbs)	206	251	278	347	379	462	513	640	817	1083	1176	1362	1486	1640
T' lbs.	107	131	145	181	197	241	267	333	426	564	613	710	774	855
WITH 0.25" LAGGING														
V (ft/min)	669	548	494	396	363	297	268	215	168	127	117	101	92	84
NLV (ft/min)	702	575	519	416	381	312	281	226	177	133	123	106	97	88
BP (lbs)	198	241	268	334	364	444	493	615	786	1042	1131	1309	1428	1577
T' lbs.	107	131	145	181	197	241	267	333	426	564	613	710	774	855
TM315 - 430 (3.0 HP 1740 RPM)		Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 282.20 LBS. @ L=23.62"												
V (ft/min)	524	429	387	310	243	183	169	146	133	121				
NLV (ft/min)	550	451	406	326	255	192	177	153	140	127				
BP (lbs)	189	231	256	320	408	542	588	681	743	820				
T' lbs.	99	120	134	167	213	282	306	355	387	427				
WITH 0.25" LAGGING														
V (ft/min)	544	446	402	322	252	190	175	151	139	126				
NLV (ft/min)	572	469	422	339	265	200	184	159	146	132				
BP (lbs)	182	222	247	307	393	521	565	655	714	789				
T' lbs.	99	120	134	167	213	282	306	355	387	427				
TM315 - 630 (3.0 HP 1125 RPM)		Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 282.20 LBS. @ L=23.62"												
V (ft/min)	349	286	258	207	162	122	112	97	89	81				
NLV (ft/min)	367	300	271	217	170	128	118	102	93	85				
BP (lbs)	284	347	385	480	613	812	882	1021	1114	1230				
T' lbs.	148	181	200	250	319	423	460	532	581	641				

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 3.92 lbs. per inch above 23.62 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.

TM315 SERIES (12.5" diameter)



SPECIFICATIONS

WITH 0.25" LAGGING

V (ft/min)	363	297	268	215	168	127	117	101	92	84
NLV (ft/min)	381	312	281	226	177	133	123	106	97	88
BP (lbs)	273	333	370	461	589	781	848	982	1071	1183
T' lbs.	148	181	200	250	319	423	460	532	581	641

TM315 - 830 (3.0 HP 850 RPM) Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 291.00 LBS. @ L=23.62"

V (ft/min)	262	214	193	155	121	91	84	73	67	60
NLV (ft/min)	275	225	203	163	127	96	88	76	70	63
BP (lbs)	379	462	513	640	817	1083	1176	1362	1486	1640
T' lbs.	197	241	267	333	426	564	613	710	774	855

WITH 0.25" LAGGING

V (ft/min)	272	223	201	161	126	95	88	76	69	63
NLV (ft/min)	286	234	211	169	132	100	92	80	73	66
BP (lbs)	364	444	493	615	786	1042	1131	1309	1428	1577
T' lbs.	197	241	267	333	426	564	613	710	774	855

TM315 - 620 (2.0 HP 1125 RPM) Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 291.00 LBS. @ L=23.62"

V (ft/min)	349	286	258	207	162	122	112	97	89	81
NLV (ft/min)	367	300	271	217	170	128	118	102	93	85
BP (lbs)	189	231	256	320	408	542	588	681	743	820
T' lbs.	99	120	134	167	213	282	306	355	387	427

WITH 0.25" LAGGING

V (ft/min)	363	297	268	215	168	127	117	101	92	84
NLV (ft/min)	381	312	281	226	177	133	123	106	97	88
BP (lbs)	182	222	247	307	393	521	565	655	714	789
T' lbs.	99	120	134	167	213	282	306	355	387	427

TM315 - 820 (2.0 HP 850 RPM) Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 291.00 LBS. @ L=23.62"

V (ft/min)	262	214	193	155	121	91	84	73	67	60
NLV (ft/min)	275	225	203	163	127	96	88	76	70	63
BP (lbs)	252	308	342	426	545	722	784	908	990	1093
T' lbs.	132	161	178	222	284	376	409	473	516	570

WITH 0.25" LAGGING

V (ft/min)	272	223	201	161	126	95	88	76	69	63
NLV (ft/min)	286	234	211	169	132	100	92	80	73	66
BP (lbs)	242	296	329	410	524	694	754	873	952	1051
T' lbs.	132	161	178	222	284	376	409	473	516	570

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 3.92 lbs. per inch above 23.62 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.

TM315 SERIES (12.5" diameter)



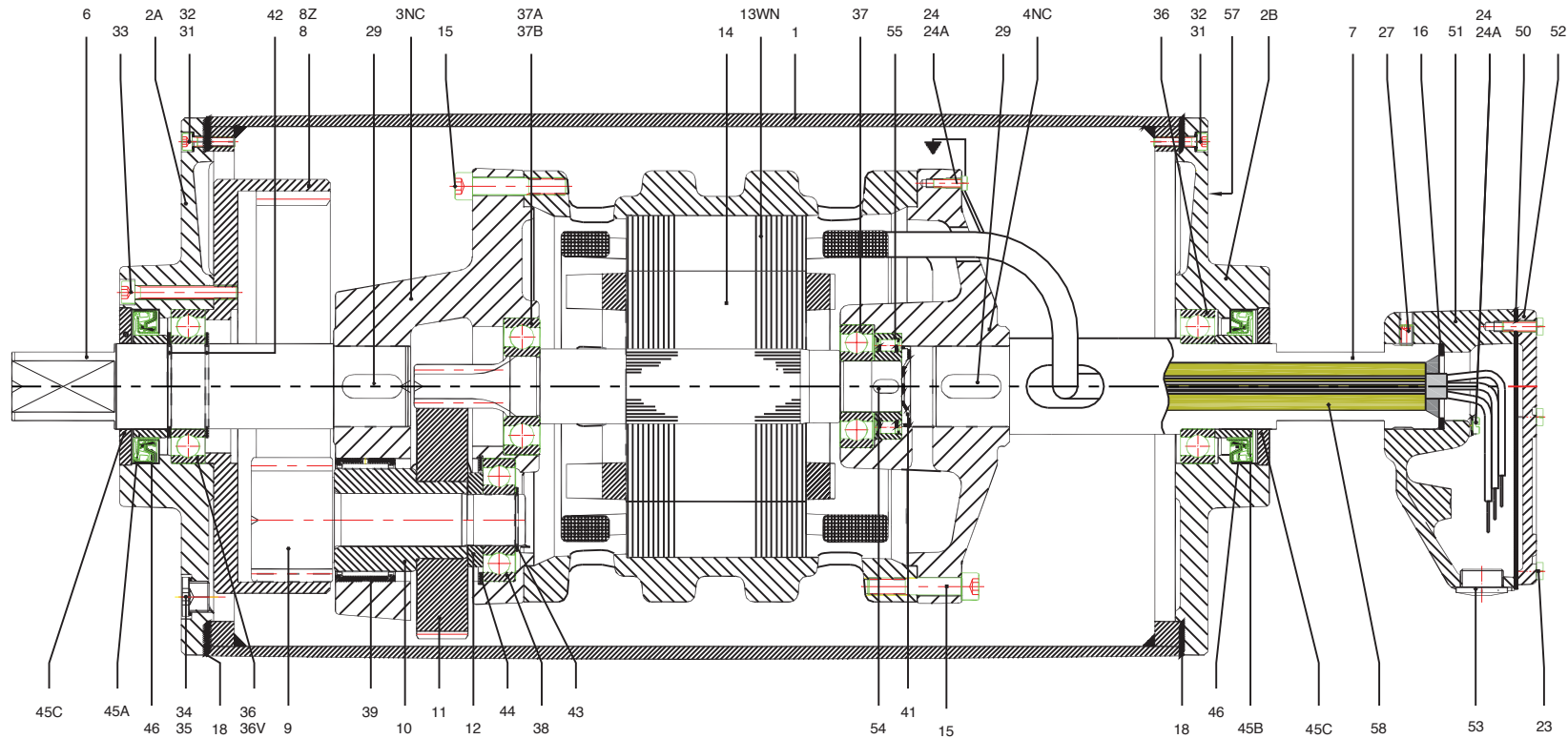
SPECIFICATIONS

TM315 - 1220 (2.0 HP 550 RPM)				Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 291.00 LBS. @ L=23.62"						
V (ft/min)	174	143	129	103	81	61	56	48	44	40
NLV (ft/min)	183	150	135	108	85	64	59	51	47	52
BP (lbs)	379	462	513	640	817	1083	1176	1362	1486	1640
T' lbs.	197	241	267	333	426	564	613	710	774	855
WITH 0.25" LAGGING										
V (ft/min)	181	149	134	107	84	63	58	50	46	42
NLV (ft/min)	191	156	141	113	88	66	61	53	48	44
BP (lbs)	364	444	493	615	786	1042	1131	1309	1428	1577
T' lbs.	197	241	267	333	426	564	613	710	774	855
TM315 - 815 (1.5 HP 850 RPM)				Minimum Face Width (L): DESIGN A = 19.69" DESIGN B = 21.65" WEIGHT = 282.20 LBS. @ L=23.62"						
V (ft/min)	262	214	193	155	121	91	84	73	67	60
NLV (ft/min)	275	225	203	163	127	96	88	76	70	63
BP (lbs)	189	231	256	320	408	542	588	681	743	820
T' lbs.	99	120	181	226	289	383	306	355	387	427
WITH 0.25" LAGGING										
V (ft/min)	272	223	201	161	126	95	88	76	69	63
NLV (ft/min)	286	234	211	169	132	100	92	80	73	66
BP (lbs)	182	22	247	307	393	521	565	655	714	789
T' lbs.	99	120	181	226	289	383	306	355	387	427

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 3.92 lbs. per inch above 23.62 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.



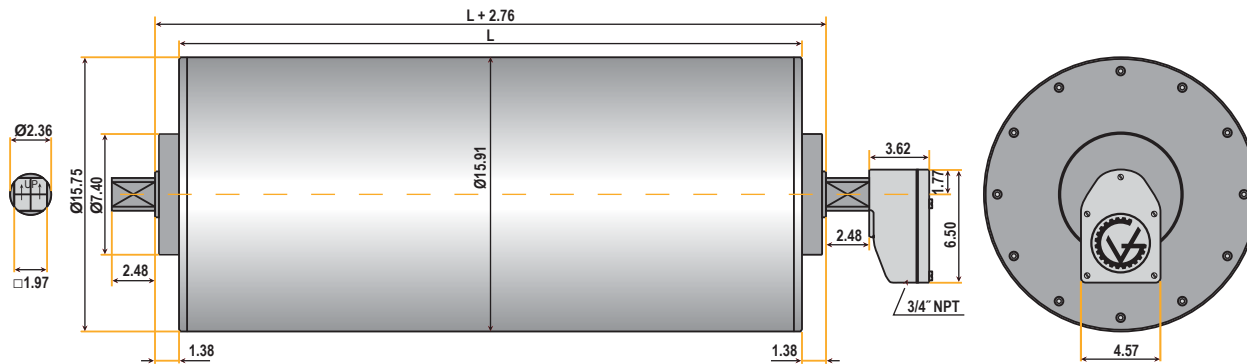
ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION
1	Shell	18	Gasket	38	Ball Bearing	55	Backstop Bearing (Optional)
2A	End Flange	20	Terminal Board	39	Needle Bearing	57	Data Plate
2B	End Flange	23	Fillister head Machine Screw	41	Disc	58	Epoxy Resin
3NC	Gear Housing	24	Fillister head Machine Screw	42	Snap Ring		
4NC	Motor Flange	24 A	Lock Washer	43	Snap Ring		
6	Shaft End	27	Set Screw	44	Snap Ring		
7	Hollow Shaft	29	Key	45 A	Bearing race		
8 Z	Internal Gear	31	Socket Head Cap Screw	45 B	Bearng race		
9/10	Pinion With Bushing	32	Bonded Seal Washer	45 C	End Plate		
11	Gear	33	Socket Head Cap Screw	46	Cassette Seal		
12	Distance Ring	34	Filler Plug	50	Seal		
13WN	Stator	35	Washer	51	Junction Box		
14	Rotor	36	Ball Bearing	52	Junction Box Cover		
15	Socket Head Cap Screw	36V	Cylindrical Roller Bearing	53	Plug		
16	Nitrile Gasket	37	Ball Bearing	54	Key (Optional)		

TM400 SERIES (16.0" diameter)



DIMENSIONS (in inches)

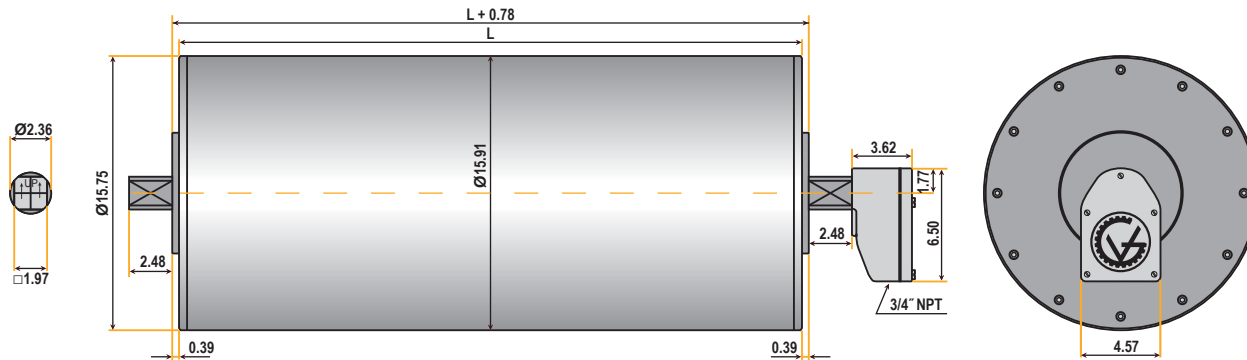
TM400A60 Drum Motor (matching Idler KT400A60**)



Standard face widths* (L) in inches:

23.62	25.59	27.56	29.53	31.50	33.46	35.43	37.40	39.37
41.34	43.31	45.28	47.24	49.21	51.18	53.15	55.12	57.09
59.06								

TM400B60 Drum Motor (matching Idler KT400B60**)



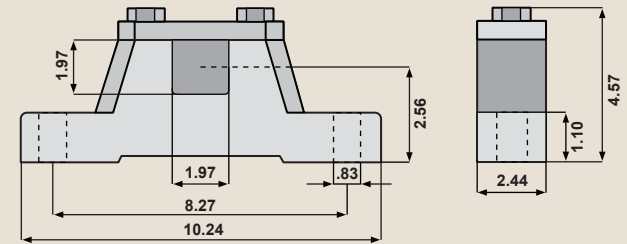
Standard face widths* (L) in inches:

25.59	27.56	29.53	31.50	33.46	35.43	37.40	39.37	41.34
43.31	45.28	47.24	49.21	51.18	53.15	55.12	57.09	59.06

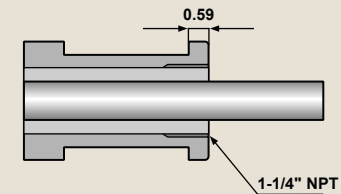
*Some face widths are not available in all horsepower. For minimum available face widths refer to TM400 Specifications.

**Idler dimensions are identical to the drum motor with no junction box.

Bracket AB 60



Optional Cable Type



Note: When Optional Cable Type is selected, the minimum face width (L) increases by 3.94 inches.

TM400 SERIES (16.0" diameter)



SPECIFICATIONS

TM400 - 420 (20.0 HP 1740 RPM)	Minimum Face Width (L): DESIGN A = 27.56" DESIGN B = 29.53"												WEIGHT = 539.40 LBS. @ L=25.59"
V (ft/min)	885	639	591	534	501	420	386	354	306	254	214	185	153
NLV (ft/min)	920	665	614	555	520	437	401	368	318	264	222	192	159
BP (lbs)	747	1033	1119	1238	1320	1573	1713	1867	2160	2600	3094	3581	4310
T' lbs.	494	684	741	820	874	1042	1134	1236	1431	1722	2049	2371	2854
WITH 0.25" LAGGING													
V (ft/min)	913	660	609	551	516	433	398	365	315	262	220	190	158
NLV (ft/min)	949	686	633	572	537	450	414	380	328	272	229	198	164
BP (lbs)	724	1002	1085	1200	1280	1526	1661	1810	2094	2521	3000	3472	4179
T' lbs.	494	684	741	820	874	1042	1134	1236	1431	1722	2049	2371	2854
TM400 - 415 (15.0 HP 1740 RPM)													
Minimum Face Width (L): DESIGN A = 25.59" DESIGN B = 27.56"												WEIGHT = 534.50 LBS. @ L=25.59"	
V (ft/min)	885	639	591	534	501	420	386	354	306	254	214	185	153
NLV (ft/min)	920	665	614	555	520	437	401	368	318	264	222	192	159
BP (lbs)	560	775	839	928	990	1180	1285	1400	1620	1950	2321	2685	3233
T' lbs.	371	513	556	615	656	782	851	927	1073	1292	1537	1779	2141
WITH 0.25" LAGGING													
V (ft/min)	913	660	609	551	516	433	398	365	315	262	220	190	158
NLV (ft/min)	949	686	633	572	537	450	414	380	328	272	229	198	164
BP (lbs)	543	751	814	900	960	114	1246	1357	1571	1891	2250	2604	3134
T' lbs.	371	513	556	615	656	782	851	927	1073	1292	1537	1779	2141
TM400 - 410 (10.0 HP 1740 RPM)													
Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59"												WEIGHT = 507.10 LBS. @ L=25.59"	
V (ft/min)	885	639	591	534	501	420	386	354	306	254	214	185	153
NLV (ft/min)	920	665	614	555	520	437	401	368	318	264	222	192	159
BP (lbs)	373	517	559	619	660	787	856	933	1080	1300	1547	1790	2155
T' lbs.	247	342	370	410	437	521	567	618	715	861	1025	1186	1427
WITH 0.25" LAGGING													
V (ft/min)	913	660	609	551	516	433	398	365	315	262	220	190	158
NLV (ft/min)	949	686	633	572	537	450	414	380	328	272	229	198	164
BP (lbs)	362	501	542	600	640	763	830	905	1047	1260	1500	1736	2089
T' lbs.	247	342	370	410	437	521	567	618	715	861	1025	1186	1427
TM400 - 475 (7.5 HP 1740 RPM)													
Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59"												WEIGHT = 496.00 LBS. @ L=25.59"	
V (ft/min)	534	386	302	228	214	185	153						
NLV (ft/min)	555	401	314	237	222	192	159						
BP (lbs)	464	642	821	1088	1160	1343	1616						
T' lbs.	307	425	543	720	768	889	1070						

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 6.72 lbs. per inch above 25.59 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.

TM400 SERIES (16.0" diameter)



SPECIFICATIONS

WITH 0.25" LAGGING

V (ft/min)	551	398	311	235	220	190	158
NLV (ft/min)	572	414	324	244	229	198	164
BP (lbs)	450	623	796	1055	1125	1302	1567
T' lbs.	307	425	543	720	768	889	1070

TM400 - 675 (7.5 HP 1125 RPM) Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59" WEIGHT = 496.00 LBS. @ L=25.59"

V (ft/min)	356	257	201	152	142	123	102
NLV (ft/min)	370	267	209	158	148	128	106
BP (lbs)	696	964	1231	1632	1741	2014	2424
T' lbs.	461	638	815	1081	1153	1334	1606

WITH 0.25" LAGGING

V (ft/min)	367	265	208	157	147	127	105
NLV (ft/min)	382	276	216	163	153	132	110
BP (lbs)	675	934	1193	1582	1688	1953	2351
T' lbs.	461	638	815	1081	1153	1334	1606

TM400 - 455 (5.5 HP 1740 RPM) Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59" WEIGHT = 485.00 LBS. @ L=25.59"

V (ft/min)	534	386	302	228	214	185	153
NLV (ft/min)	555	401	314	237	222	192	159
BP (lbs)	340	471	602	798	851	985	1185
T' lbs.	225	312	398	528	564	652	785

WITH 0.25" LAGGING

V (ft/min)	551	398	311	235	220	190	158
NLV (ft/min)	572	414	324	244	229	198	164
BP (lbs)	330	457	583	773	825	955	1149
T' lbs.	225	312	398	528	564	652	785

TM400 - 655 (5.5 HP 1125 RPM) Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59" WEIGHT = 485.00 LBS. @ L=25.59"

V (ft/min)	356	257	201	152	142	123	102
NLV (ft/min)	370	267	209	158	148	128	106
BP (lbs)	511	707	902	1197	1276	1477	1778
T' lbs.	338	468	590	792	845	978	1177

WITH 0.25" LAGGING

V (ft/min)	367	265	208	157	147	127	105
NLV (ft/min)	382	276	216	163	153	132	110
BP (lbs)	495	685	875	1160	1238	1432	1724
T' lbs.	338	468	590	792	845	978	1177

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 6.72 lbs. per inch above 25.59 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.

TM400 SERIES (16.0" diameter)



SPECIFICATIONS

TM400 - 440 (4.0 HP 1740RPM)	Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59"							WEIGHT = 474.00 LBS. @ L=25.59"
V (ft/min)	534	386	302	228	214	185	153	
NLV (ft/min)	555	401	314	237	222	192	159	
BP (lbs)	248	343	438	580	619	716	862	
T' lbs.	164	227	290	384	410	474	571	
WITH 0.25" LAGGING								
V (ft/min)	551	398	311	235	220	190	158	
NLV (ft/min)	572	414	324	244	229	198	164	
BP (lbs)	240	332	424	562	600	694	836	
T' lbs.	164	227	290	384	410	474	571	
TM400 - 840 (4.0 HP 850 RPM)	Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59"							WEIGHT = 496.00 LBS. @ L=25.59"
V (ft/min)	267	193	151	114	107	92	77	
NLV (ft/min)	277	200	157	118	111	96	80	
BP (lbs)	495	685	875	1160	1238	1432	1724	
T' lbs.	328	454	580	768	820	949	1142	
WITH 0.25" LAGGING								
V (ft/min)	275	199	156	117	110	95	79	
NLV (ft/min)	286	207	162	122	114	99	82	
BP (lbs)	480	664	849	1125	1200	1389	1671	
T' lbs.	328	454	580	768	820	949	1142	
TM400 - 830 (3.0 HP 850 RPM)	Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59"							WEIGHT = 485.00 LBS. @ L=25.59"
V (ft/min)	267	193	151	114	107	92	77	
NLV (ft/min)	277	200	157	118	111	96	80	
BP (lbs)	371	514	656	870	928	1074	1293	
T' lbs.	246	340	435	576	615	711	856	
WITH 0.25" LAGGING								
V (ft/min)	275	199	156	117	110	95	79	
NLV (ft/min)	286	207	162	122	114	99	82	
BP (lbs)	380	498	636	844	900	1041	1254	
T' lbs.	246	340	435	576	615	711	856	
TM400 - 1230 (3.0 HP 550 RPM)	Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59"							WEIGHT = 507.00 LBS. @ L=25.59"
V (ft/min)	178	129	101	76	71	61	51	
NLV (ft/min)	185	134	105	79	74	64	53	
BP (lbs)	557	771	985	1305	1392	1611	1940	
T' lbs.	369	510	652	865	922	1067	1284	

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 6.72 lbs. per inch above 25.59 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.

TM400 SERIES (16.0" diameter)



SPECIFICATIONS

WITH 0.25" LAGGING

V (ft/min)	184	133	104	78	73	63	53
NLV (ft/min)	191	138	108	81	76	66	54
BP (lbs)	540	747	955	1266	1350	1562	1880
T' lbs.	369	510	652	865	922	1067	1284

TM400 - 1220 (2.0 HP 550 RPM) Minimum Face Width (L): DESIGN A = 23.62" DESIGN B = 25.59" WEIGHT = 507.00 LBS. @ L=25.59"

V (ft/min)	178	129	101	76	71	61	51
NLV (ft/min)	185	134	105	79	74	64	53
BP (lbs)	371	514	656	870	928	1074	1293
T' lbs.	246	340	435	576	615	711	856

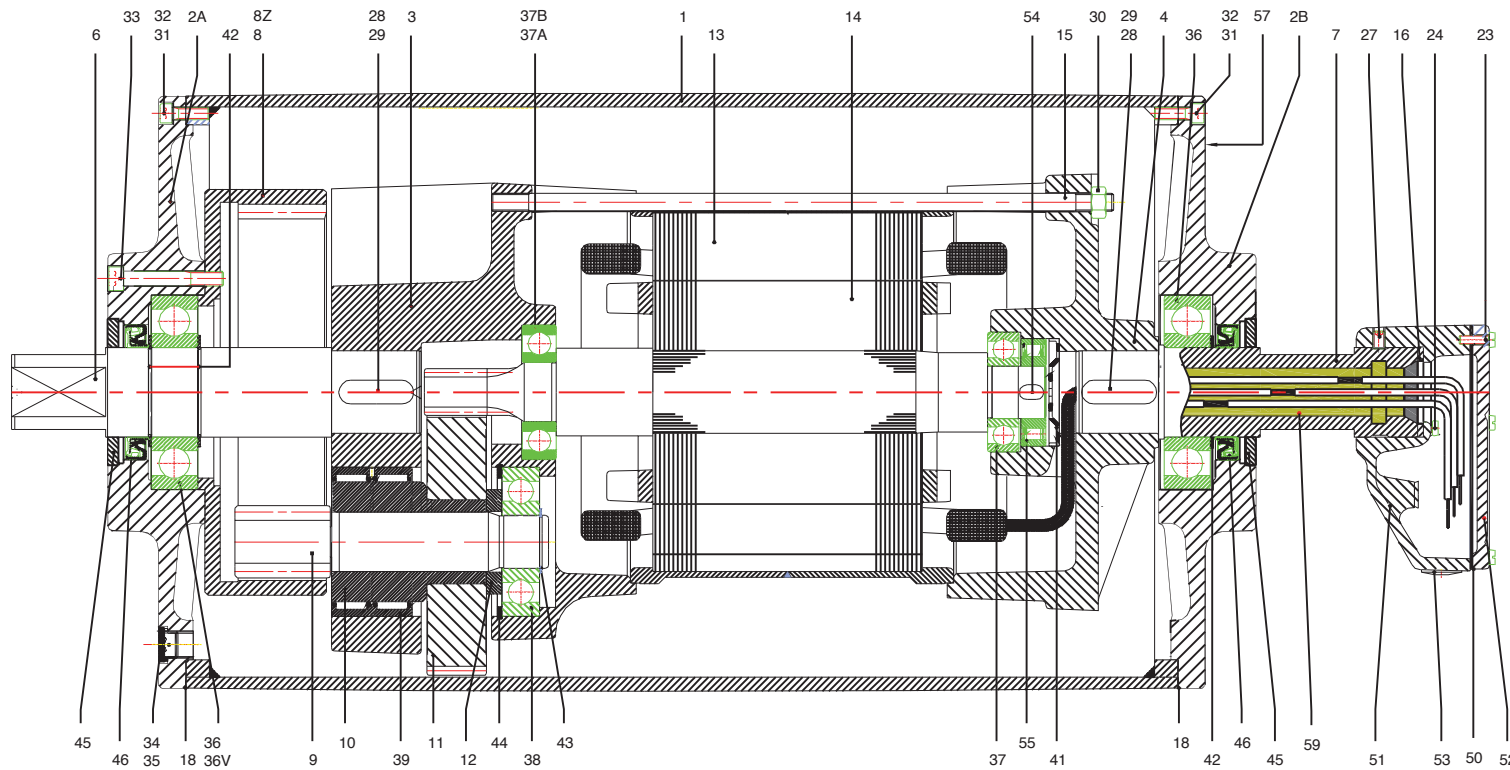
WITH 0.25" LAGGING

V (ft/min)	184	133	104	78	73	63	53
NLV (ft/min)	191	138	108	81	76	66	54
BP (lbs)	360	498	636	844	900	1041	1254
T' lbs.	246	340	435	576	615	711	856

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

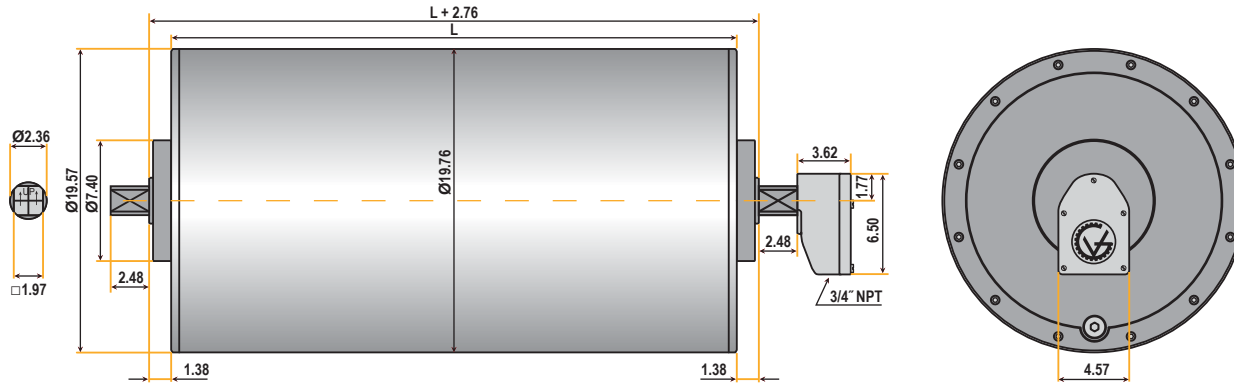
NOTE: Total weight of the unit increases by 6.72 lbs. per inch above 25.59 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.



ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION
1	Shell	18	Gasket	37	Ball Bearing	55	Backstop Bearing - Optional
2A	End Flange	20	Terminal Board	37 A	Ball Bearing	57	Data Plate
2B	End Flange	23	Fillister head Machine Screw	38	Ball Bearing	59	Epoxy Resin
3	Gear Housing	24	Fillister head Machine Screw	39	Needle Bearing		
4	Motor Flange	27	Set Screw	41	Disc		
6	Shaft End	28	Set Screw	42	Snap Ring		
7	Hollow Shaft	29	Key	43	Snap Ring		
8 Z	Internal Gear	30	Nut	44	Snap Ring		
9/10	Pinion with Bushing	31	Socket Head Cap Screw	45	End Plate		
11	Gear	32	Bonded Seal Washer	46	Cassette Seal		
12	Distance Ring	33	Socket Head Cap Screw	50	Seal		
13	Stator	34	Filler Plug	51	Junctin Box		
14	Rotor	35	Washer	52	Junction Box Cove		
15	Threaded Rod	36	Ball Bearing	53	Plug		
16	Nitrile Gasket	36 V	Cylindrical Roller Bearing	54	Key - Optional		

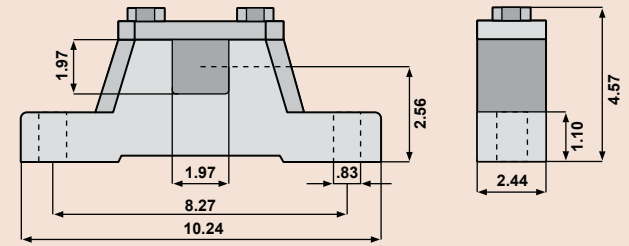
TM500A60 Drum Motor (matching Idler KT500A60)**



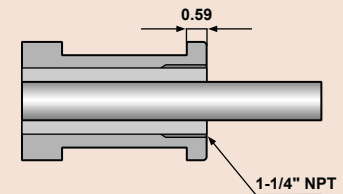
Standard face widths* (L) in inches:

23.62	25.59	27.56	29.53	31.50	33.46	35.43	37.40	39.38
41.34	43.31	45.28	47.24	49.21	51.18	53.15	55.12	57.09
59.06								

Bracket AB 60



Optional Cable Type



Note: When Optional Cable Type is selected, the minimum face width (L) increases by 3.94 inches.

*Some face widths are not available in all horsepower. For minimum available face widths refer to TM500A60 Specifications.

**Idler dimensions are identical to the drum motor with no junction box.

TM500A60 SERIES (20.0" diameter)



SPECIFICATIONS

TM500A60 - 420		(20.0 HP 1740 RPM)				Minimum Face Width (L): DESIGN A = 27.56"								WEIGHT = 773.80 LBS. @ L=25.59"	
V (ft/min)	1111	802	741	670	628	527	484	444	384	319	268	232	192		
NLV (ft/min)	1143	826	762	689	646	542	498	457	395	328	276	238	198		
BP (lbs)	595	823	892	986	1052	1254	1365	1488	1721	2072	2466	2853	3435		
T ' lbs.	489	677	733	811	865	1301	1123	1224	1416	1704	2028	2347	2825		
WITH 0.25" LAGGING															
V (ft/min)	1139	823	760	687	644	540	496	455	394	327	275	237	197		
NLV (ft/min)	1172	846	782	707	663	556	511	469	405	336	283	244	203		
BP (lbs)	580	803	870	962	1026	1223	1331	1451	1679	2021	2405	2783	3350		
T ' lbs.	489	677	733	811	865	1031	1123	1224	1416	1704	2028	2347	2825		
TM500A60 - 415 (15.0 HP 1740 RPM) Minimum Face Width (L): DESIGN A = 25.59" WEIGHT = 763.50 LBS. @ L=25.59"															
V (ft/min)	1111	802	741	670	628	527	484	444	384	319	268	232	192		
NLV (ft/min)	1143	826	762	689	646	542	498	457	395	328	276	238	198		
BP (lbs)	446	618	669	740	789	940	1024	1116	1291	1554	1849	2140	2576		
T ' lbs.	367	508	550	608	649	773	842	918	1062	1278	1521	1760	2119		
WITH 0.25" LAGGING															
V (ft/min)	1139	823	760	687	644	540	496	455	394	327	275	237	197		
NLV (ft/min)	1172	846	782	707	663	556	511	469	405	336	283	244	203		
BP (lbs)	435	602	652	721	769	917	998	1088	1259	1516	1804	2087	2512		
T ' lbs.	367	508	550	608	649	773	842	918	1062	1278	1521	1760	2119		
TM500A60 - 410 (10.0 HP 1740 RPM) Minimum Face Width (L): DESIGN A = 23.62" WEIGHT = 745.10 LBS. @ L=25.59"															
V (ft/min)	1111	802	741	670	628	527	484	444	384	319	268	232	192		
NLV (ft/min)	1143	826	762	689	646	542	498	457	395	328	276	238	198		
BP (lbs)	297	412	446	493	526	627	682	744	861	1036	1233	1427	1717		
T ' lbs.	245	339	367	406	433	516	561	612	708	852	1014	1173	1413		
WITH 0.25" LAGGING															
V (ft/min)	1139	823	760	687	644	540	496	455	394	327	275	237	197		
NLV (ft/min)	1172	846	782	707	663	556	511	469	405	336	283	244	203		
BP (lbs)	290	402	435	481	513	611	666	725	839	1010	1202	1391	1675		
T ' lbs.	245	339	367	406	433	516	561	612	708	852	1014	1173	1413		
TM500A60 - 475 (7.5 HP 1740 RPM) Minimum Face Width (L): DESIGN A = 23.62" WEIGHT = 734.10 LBS. @ L=25.59"															
V (ft/min)	670	484	379	286	268	232	192								
NLV (ft/min)	689	498	390	294	276	238	198								
BP (lbs)	370	512	654	867	925	1070	1288								
T ' lbs.	304	421	538	713	761	880	1059								

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 10.64 lbs. per inch above 25.59 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.

TM500A60 SERIES (20.0" diameter)



SPECIFICATIONS

WITH 0.25" LAGGING

V (ft/min)	687	496	389	293	275	237	197
NLV (ft/min)	707	511	400	302	283	244	203
BP (lbs)	361	499	638	845	902	1044	1256
T' lbs.	304	421	538	713	761	880	1059

TM500A60 - 675 (7.5 HP 1150 RPM) Minimum Face Width (L): DESIGN A = 23.62" WEIGHT = 734.10 LBS. @ L=25.59"

V (ft/min)	447	323	253	191	179	154	128
NLV (ft/min)	460	332	260	196	184	159	132
BP (lbs)	555	768	981	1300	1387	1605	1932
T' lbs.	456	632	807	1070	1141	1320	1589

WITH 0.25" LAGGING

V (ft/min)	458	331	259	195	183	158	131
NLV (ft/min)	471	340	266	201	188	163	135
BP (lbs)	541	749	957	1268	1353	1565	1884
T' lbs.	456	632	807	1070	1141	1320	1589

TM500A60 - 455 (5.5 HP 1740 RPM) Minimum Face Width (L): DESIGN A = 23.62" WEIGHT = 723.10 LBS. @ L=25.59"

V (ft/min)	670	484	379	286	268	232	192
NLV (ft/min)	689	498	390	294	276	238	198
BP (lbs)	271	375	479	636	678	785	944
T' lbs.	223	309	394	523	558	645	777

WITH 0.25" LAGGING

V (ft/min)	687	496	389	293	275	237	197
NLV (ft/min)	707	511	400	302	283	244	203
BP (lbs)	264	366	468	620	661	765	921
T' lbs.	223	309	394	523	558	645	777

TM500A60 - 655 (5.5 HP 1150 RPM) Minimum Face Width (L): DESIGN A = 23.62" WEIGHT = 723.10 LBS. @ L=25.59"

V (ft/min)	447	323	253	191	179	154	128
NLV (ft/min)	460	332	260	196	184	159	132
BP (lbs)	407	563	719	954	1017	1177	1417
T' lbs.	335	463	592	784	837	968	1165

WITH 0.25" LAGGING

V (ft/min)	458	331	259	195	183	158	131
NLV (ft/min)	471	340	266	201	188	163	135
BP (lbs)	397	549	701	930	992	1148	1382
T' lbs.	335	463	592	784	837	968	1165

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 10.64 lbs. per inch above 25.59 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.

TM500A60 SERIES (20.0" diameter)



SPECIFICATIONS

TM500A60 - 440		(4.0 HP 1740 RPM)						Minimum Face Width (L): DESIGN A = 23.62" WEIGHT = 712.80 LBS. @ L=25.59"	
V (ft/min)	670	484	379	286	268	232	192		
NLV (ft/min)	689	498	390	294	276	238	198		
BP (lbs)	197	273	349	462	493	571	687		
T ' lbs.	162	225	287	380	406	469	565		
WITH 0.25" LAGGING									
V (ft/min)	687	496	389	293	275	237	197		
NLV (ft/min)	707	511	400	302	283	244	203		
BP (lbs)	192	266	340	451	481	557	670		
T ' lbs.	162	225	287	380	406	469	565		
TM500A60 - 840		(4.0 HP 875 RPM)						Minimum Face Width (L): DESIGN A = 23.62" WEIGHT = 734.10 LBS. @ L=25.59"	
V (ft/min)	335	242	189	143	134	116	96		
NLV (ft/min)	345	249	195	147	138	119	99		
BP (lbs)	394	546	697	925	986	141	1374		
T ' lbs.	324	449	574	761	811	939	1130		
WITH 0.25" LAGGING									
V (ft/min)	343	248	194	147	137	119	98		
NLV (ft/min)	353	255	200	151	141	122	101		
BP (lbs)	385	532	680	902	962	1113	1340		
T ' lbs.	324	449	574	761	811	939	1130		
TM500A60 - 830		(3.0 HP 875 RPM)						Minimum Face Width (L): DESIGN A = 23.62" WEIGHT = 723.10 LBS. @ L=25.59"	
V (ft/min)	335	242	189	143	134	116	96		
NLV (ft/min)	345	249	195	147	138	119	99		
BP (lbs)	296	409	523	693	740	856	1030		
T ' lbs.	243	337	430	570	608	704	847		
WITH 0.25" LAGGING									
V (ft/min)	343	248	194	147	137	119	98		
NLV (ft/min)	353	255	200	151	141	122	101		
BP (lbs)	289	399	510	676	721	835	1005		
T ' lbs.	243	337	430	570	608	704	847		
TM500A60 - 1230		(3.0 HP 575 RPM)						Minimum Face Width (L): DESIGN A = 23.62" WEIGHT = 745.10 LBS. @ L=25.59"	
V (ft/min)	223	161	126	95	89	77	64		
NLV (ft/min)	230	166	130	98	92	79	66		
BP (lbs)	444	614	785	1040	1110	1284	1546		
T ' lbs.	365	505	645	856	913	1056	1271		

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

NOTE: Total weight of the unit increases by 10.64 lbs. per inch above 25.59 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.

TM500A60 SERIES (20.0" diameter)



SPECIFICATIONS

WITH 0.25" LAGGING

V (ft/min)	229	165	129	98	91	79	65
NLV (ft/min)	236	170	133	100	94	81	68
BP (lbs)	433	599	765	1015	1082	1252	1507
T' lbs.	365	505	645	856	913	1056	1271

TM500A60 - 1220 (2.0 HP 575 RPM) Minimum Face Width (L): DESIGN A = 23.62" WEIGHT = 745.10 LBS. @ L=25.59"

V (ft/min)	223	161	126	95	89	77	64
NLV (ft/min)	230	166	130	98	92	79	66
BP (lbs)	296	409	523	693	740	856	1030
T' lbs.	243	337	430	570	608	704	847

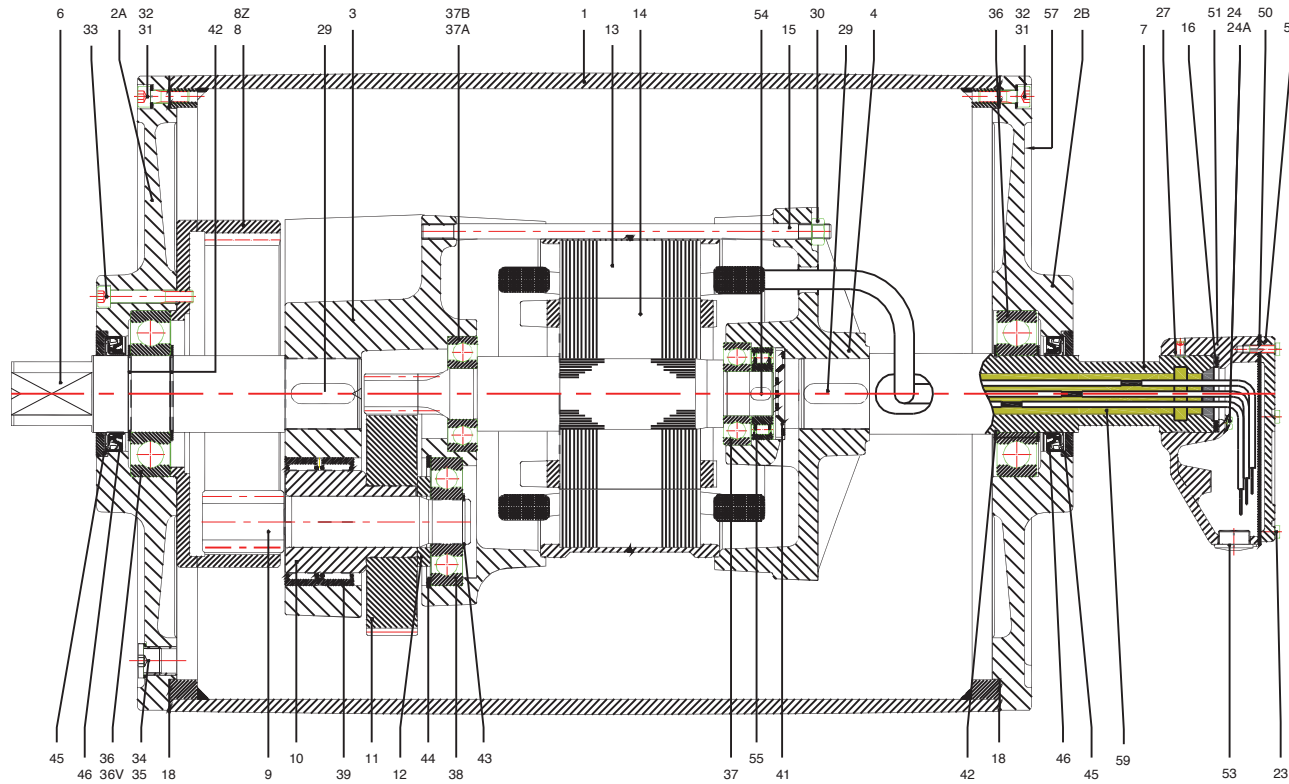
WITH 0.25" LAGGING

V (ft/min)	229	165	129	98	91	79	65
NLV (ft/min)	236	170	133	100	94	81	68
BP (lbs)	289	399	510	676	721	835	1008
T' lbs.	243	337	430	570	608	704	847

V = Velocity NLV = No Load Velocity BP = Belt Pull T = Torque RPM = Internal Electric Motor RPM

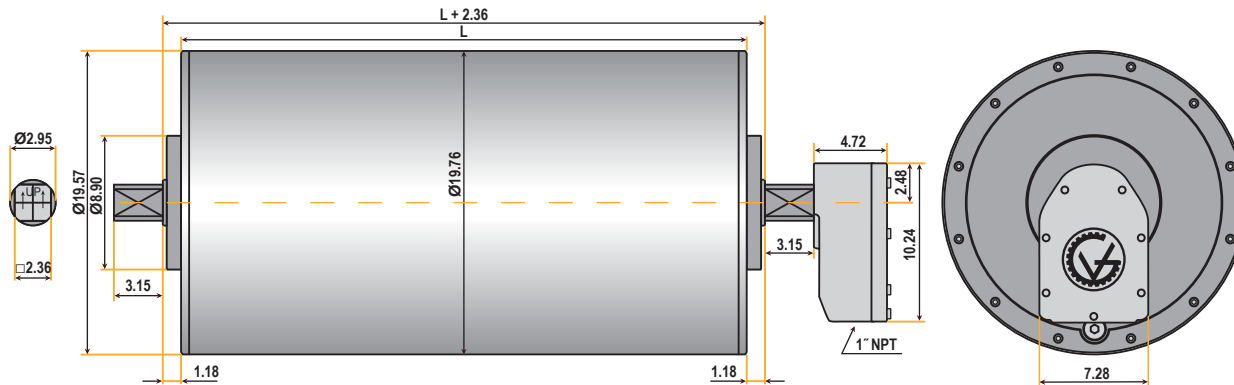
NOTE: Total weight of the unit increases by 10.64 lbs. per inch above 25.59 inches.

All drum motors are available in all standard voltages and are electrically reversible. Other belt speeds and face widths are available. Please consult Van der Graaf.



ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION
1	Shell	18	Gasket	37	Ball Bearing	55	Backstop Bearing - Optional
2A	End Flange	20	Terminal Board	37 A	Ball Bearing	57	Data Plate
2B	End Flange	23	Fillister head Machine Screw	38	Ball Bearing	59	Epoxy Resin
3	Gear Housing	24	Fillister head Machine Screw	39	Needle Bearing		
4	Motor Flange	27	Set Screw	41	Disc		
6	Shaft End	28	Set Screw	42	Snap Ring		
7	Hollow Shaft	29	Key	43	Snap Ring		
8 Z	Internal Gear	30	Nut	44	Snap Ring		
9/10	Pinion with Bushing	31	Socket Head Cap Screw	45	End Plate		
11	Gear	32	Bonded Seal Washer	46	Cassette Seal		
12	Distance Ring	33	Socket Head Cap Screw	50	Seal		
13	Stator	34	Filler Plug	51	Junctin Box		
14	Rotor	35	Washer	52	Junction Box Cove		
15	Threaded Rod	36	Ball Bearing	53	Plug		
16	Nitrile Gasket	36 V	Cylindrical Roller Bearing	54	Key - Optional		

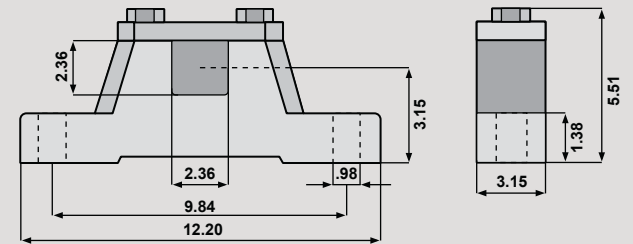
TM500A75 Drum Motor (matching Idler KT500A75)**



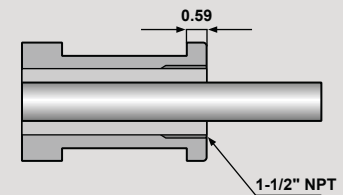
Standard face widths* (L) in inches:

33.46	35.43	37.40	39.38	41.34	43.31	45.28	47.24	49.21
51.18	53.15	55.12	57.09	59.06	61.02	62.99	64.96	66.93
68.90	70.87							

Bracket AB 75



Optional Cable Type



Note: When Optional Cable Type is selected, the minimum face width (L) increases by 5.91 inches.

*Some face widths are not available in all horsepower. For minimum available face widths refer to TM500A75 Specifications.

**Idler dimensions are identical to the drum motor with no junction box.

TM500A75 SERIES (20.0" diameter)



SPECIFICATIONS

40 HP

V (ft/min) M/G	750 4/S2	590 4/S2	468 4/S2
Belt Pull (lbs)	1763	2241	2825
Drum RPM	143	113	89

30 HP

V (ft/min) M/G	750 4/S2	590 4/S2	468 4/S2	368 4/S2
Belt Pull (lbs)	1322	1680	2119	2694
Drum RPM	143	113	89	70

25 HP

V (ft/min) M/G	750 4/S2	590 4/S2	468 4/S2	368 4/S2
Belt Pull (lbs)	1102	1400	1766	2245
Drum RPM	143	113	89	70

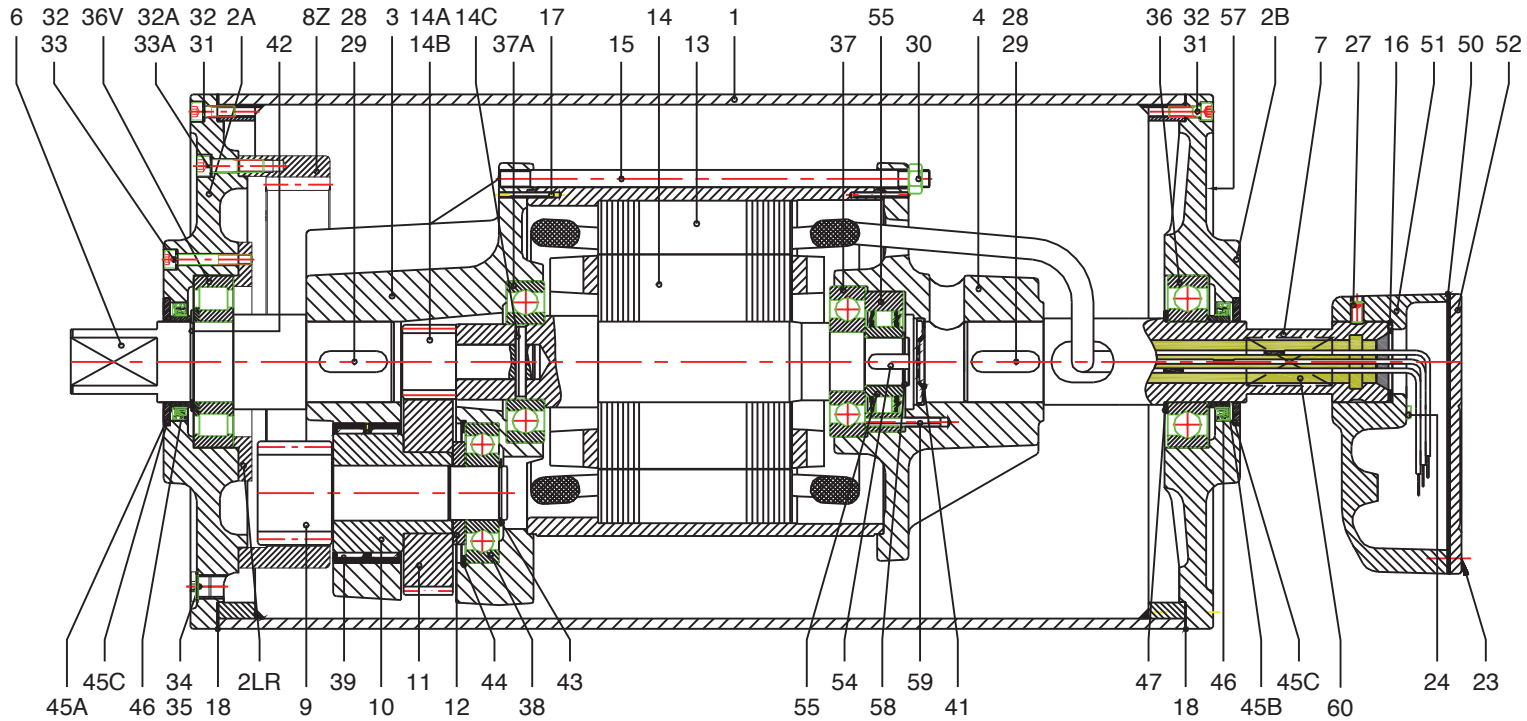
20 HP

V (ft/min) M/G	500 6/S2	393 6/S2	312 6/S2	245 6/S2
Belt Pull (lbs)	1322	1680	2119	2694
Drum RPM	95	75	60	47

V = Belt Speed (ft/min)

M/G = Motor/Gear Reducer Configuration (at rated horsepower)





ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION	ITEM	PART DESCRIPTION
1	Shell	14 C	Spiral Pin	32 A	Bonded Seal Washer	45 B	Bearing race
2A	End Flange	15	Threaded Rod	33A	Set Screw	45C	End Plate
2B	End Flange	16	Cable Passage	34	Filler Plug	46	Cassette Seal
2LR	Locking Ring	17	Spiral Pin	35	Washer	47	Shim
3	Gear Housing	18	Gasket	36	Ball Bearing	50	Seal
4	Motor Flange	20	Terminal Board	36V	Cylindrical Roller Bearing	51	Junctin Box
6	Shaft End	23	Fillister head Machine Screw	37	Ball Bearing	52	Junction Box Cove
7	Hollow Shaft	24	Fillister head Machine Screw	37 A	Ball Bearing	53	Plug
8 Z	Internal Gear	27	Set Screw	38	Ball Bearing	54	Key - Optional
9/10	Pinion with Bushing	28	Set Screw	39	Needle Bearing	55	Backstop Bearing - Optional
11	Gear	29	Key	41	Disc	57	Data Plate
12	Distance Ring	30	Nut	42	Snap Ring	58	Snap Ring - Optional
13	Stator	31	Socket Head Cap Screw	43	Snap Ring	59	Spiral Pin - Optional
14	Rotor	32	Bonded Seal Washer	44	Snap Ring	60	Epoxy Resin
14 A/B	Insert Pinion	33	Socket Head Cap Screw	45 A	Bearing race		

ELECTRIC MOTOR FULL LOAD AMP



TM315

RPM	3400	1740					1125				850			550				
HP	15.0	10.0	7.5	5.5	4.0	3.0	5.0	4.0	3.0	2.0	3.0	2.0	1.5	2.0				
Full Load Amps at:																		
240v	34.62	25.00	19.40	14.00	11.62	8.40	13.20	11.10	8.36	6.58	9.34	6.80	6.00	11.56				
480v	17.31	12.50	9.70	7.00	5.81	4.20	6.60	5.55	4.18	3.29	4.67	3.40	2.80	5.78				
600v	14.01	10.00	7.40	5.70	4.64	3.36	5.28	4.42	3.29	2.63	3.70	2.72	2.24	4.60				

TM400

RPM	1740						1125		850		550							
HP	20.0	15.0	10.0	7.5	5.5	4.0	7.5	5.5	4.0	3.0	3.0	2.0						
Full Load Amps at:																		
240v	52.00	36.00	24.30	18.40	13.40	10.00	19.35	14.20	11.20	9.20	9.60	6.80						
480v	24.25	18.00	12.15	9.20	6.70	5.00	9.67	7.10	5.60	4.60	4.80	3.40						
600v	19.58	14.50	9.72	7.36	5.36	4.00	7.60	6.00	4.50	3.70	4.00	2.83						

TM500A60

RPM	1740						1150		875		575							
HP	20.0	15.0	10.0	7.5	5.5	4.0	7.5	5.5	4.0	3.0	3.0	2.0						
Full Load Amps at:																		
240v	52.00	36.00	24.30	18.40	13.40	10.00	19.35	14.20	11.20	9.20	9.60	6.80						
480v	24.25	18.00	12.15	9.20	6.70	5.00	9.67	7.10	5.60	4.60	4.80	3.40						
600v	19.58	14.50	9.72	7.36	5.36	4.00	7.60	6.00	4.50	3.70	4.00	2.83						

TM500A75

RPM	1740				1150	875												
HP	50.0	40.0	30.0	25.0	20.0	15.0												
Full Load Amps at:																		
240v	110.80	87.24	67.40	55.60	49.78	42.00												
480v	55.40	43.62	33.70	27.80	24.89	21.00												
600v	44.32	34.80	26.50	22.23	18.70	17.50												

SCOPE

This is a comparative analysis concerning the energy consumption of a conventional conveyor with an electric motor, a gear reducer and a chain drive, and a conveyor driven by a Van der Graaf drum motor.

HYPOTHESIS

There will be considered that both conveyors, the conventional conveyor and the conveyor driven by Van der Graaf Drum Motor:

- have the same rated output power,
- operate in the same environmental conditions (temperature, pressure, humidity, altitude),
- supplied power have the same parameters (phase number, line voltage, frequency),
- loaded at the same constant output power, equal by the rated output power, for the whole period of the considered operation time.

CALCULATION

- The conventional conveyor (index C from conventional) operates with a Baldor motor VM3615T, with rated output power 5 hp, (or 3730 W, rated speed 1750 rpm, rated voltage 3 x 460 V, rated frequency 60 Hz), a coupling, a right angle gear reducer with a gear ratio 20, and a chain drive with ratio 1.5. The electric motor has the rated efficiency 85.5%, the coupling has the efficiency 99%, the gear reducer is a worm gear reducer with efficiency of 87% [6.5] and the chain drive has the efficiency 75%. (See page 29, Diagram B)

The total efficiency of the Conventional Conveyor is:

$$\eta_C = 0.855 \times 0.99 \times 0.87 \times 0.75 = 0.552, \text{ or } 55.2\%$$

The input power (index 1 for input and 2 for output) of the conventional conveyor is:

$$P_{1C} = P_{2C} / \eta_C = 3730 / 0.552 = 6757.25 \text{ W} \approx 6.757 \text{ kW}$$

- The conveyor (index M from drum motor) driven by a Van der Graaf Drum Motor is considered. It has the same rated output power as the conventional conveyor, 5 hp or 3730 W and contains an electric motor with rated efficiency 87% and a parallel-shaft gear reducer with efficiency 0.96%. (See page 29, Diagram A)

The total efficiency of the conveyor driven by Van der Graaf Drum Motor is:

$$\eta_M = 0.87 \times 0.96 = 0.835, \text{ or } 83.5\%$$

The input power (1 for input and 2 for output) of the conveyor driven by Van der Graaf drum motor is:

$$P_{1M} = P_{2M} / \eta_M = 3730 / 0.835 = 4467 \text{ W} = 4.467 \text{ kW}$$

- An operation time of both conveyors is determined taking into consideration that both conveyors work 8 hours shift, 2 shifts per day, 5 days per week, and 52 weeks per year, $t = 8 \text{ hours/shift} \times 2 \text{ shift/day} \times 5 \text{ days/week} \times 52 \text{ weeks/year} = 4160 \text{ hours/year}$.

- The electric energy consumed by the conventional conveyor, in the considered operation time, is determined by the product of the input active power and the operation time:

$$E_C = P_{1C} \times t = 6.757 \text{ kW} \times 4160 \text{ hours/year} = 28109.12 \text{ kWh/yr} \approx 28109 \text{ kWh/yr}$$

- The electric energy consumed by the conveyor driven by Van der Graaf Drum Motor, in the considered operation time, is similarly determined:

$$E_M = P_{1M} \times t = 4.467 \text{ kW} \times 4160 \text{ hours/year} = 18583 \text{ kWh/yr}$$

- An average price of the electric energy in USA is considered: $p = 0.08 \text{ USD/kWh}$.

- The cost of the electric energy per year of the conventional conveyor will be calculated as the product between the consumed electric energy in the considered operation time and the specific price of the electric energy:

$$C_C = E_C \times p = 28109 \text{ kWh/yr} \times 0.08 \text{ USD/kWh} = 2248.72 \text{ USD/yr} \approx 2249 \text{ USD/yr}$$

- The cost of the electric energy per year of the conveyor driven by Van der Graaf drum motor will be similarly calculated:

$$C_M = E_M \times p = 18583 \text{ kWh/yr} \times 0.08 \text{ USD/kWh} = 1486.64 \text{ USD/yr} \approx 1487 \text{ USD/yr}$$

- The energy saving per year of the higher efficient conveyor, respectively of the conveyor driven by Van der Graaf drum motor, is determined as a difference between the consumed energy of the conventional conveyor and the consumed energy of the conveyor driven by Van der Graaf drum motor, in the considered operation time of one year period (See page 29, Graph 1)

$$ES = E_C - E_M = 28109 \text{ kWh/yr} - 18583 \text{ kWh/yr} = 9562 \text{ kWh/yr}$$

- The cost saving per year of the higher efficient conveyor, respectively of the conveyor with Van der Graaf drum motor, is determined as a difference between the cost of the consumed energy of the conventional conveyor and the cost of the consumed energy of the conveyor driven by Van der Graaf drum motor, in the considered operation time of one year period (See page 29, Graph 2)

$$CS = C_C - C_M = 2249 \text{ USD/yr} - 1487 \text{ USD/yr} = 762 \text{ USD/yr}$$

ENERGY COST SAVINGS WITH CONVEYOR DRIVEN BY VAN DER GRAAF DRUM MOTOR IS 762 USD/YEAR

NOTE: If the cost of energy of the conventional conveyor is considered 100%, than the cost of energy of the conveyor driven by Van der Graaf Drum Motor is 66% and the cost savings with the Van der Graaf Drum Motor is 34%.

Diagram A: Conveyor Driven by a Van der Graaf Drum Motor

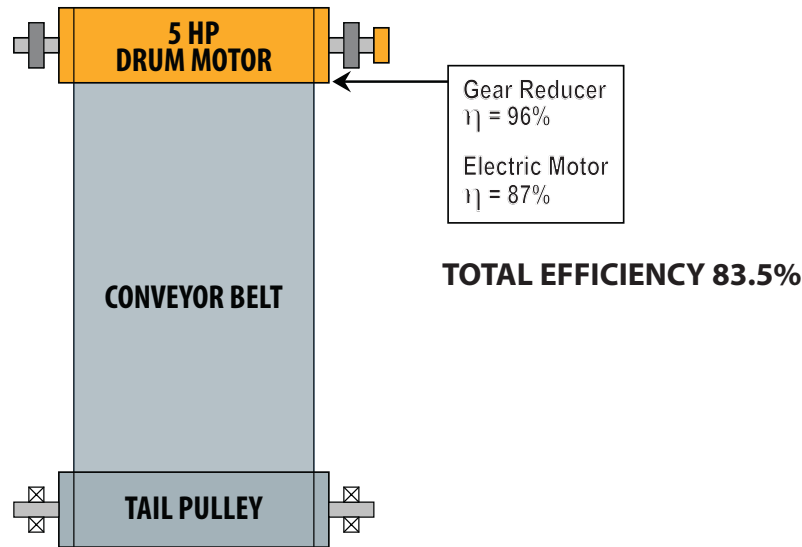
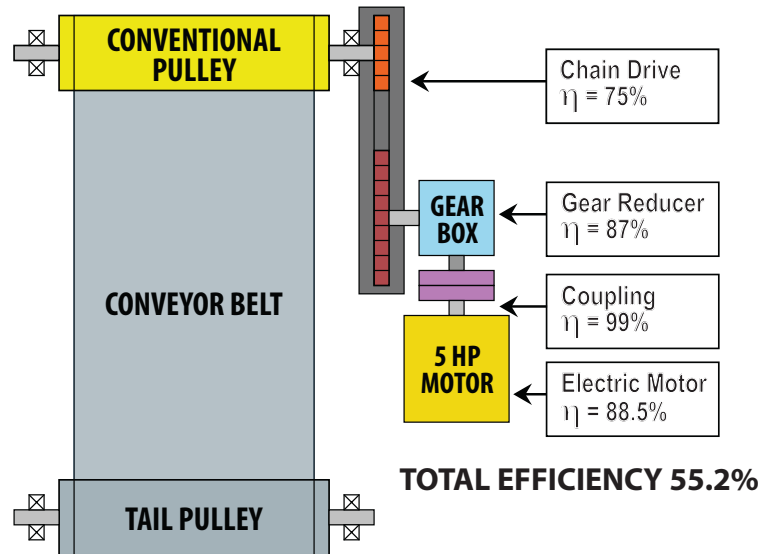
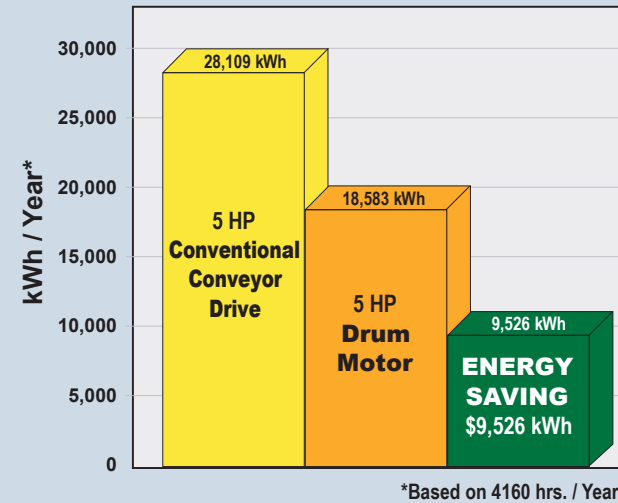


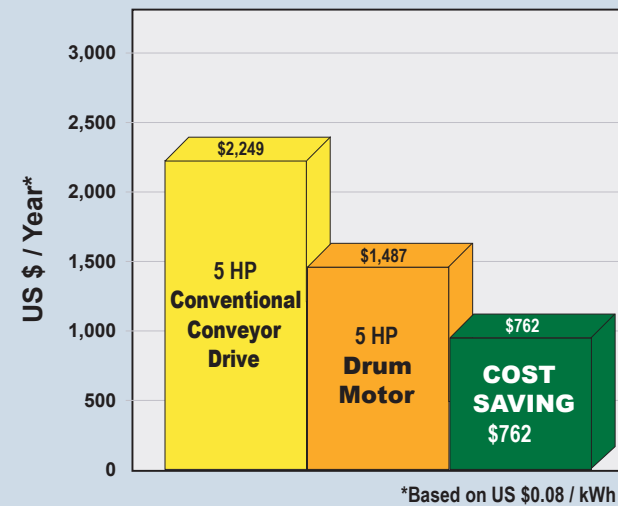
Diagram B: Conveyor Driven by a Conventional Conveyor Drive





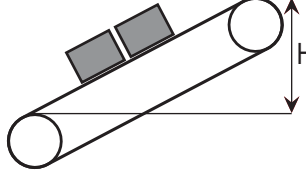
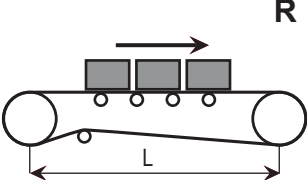
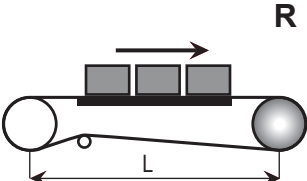
Graph 1: Energy Consumption Comparison



Graph 2: Energy Cost Comparison



BELT PULL CALCULATION

Conveying System	F_0  Force without load	F_1  Force to convey materials horizontally	F_2  Force to convey materials on incline	<p style="text-align: center;">BELT PULL(BP): $BP = (F_0 + F_1 + F_2)$ in pounds</p> <p>F = Force (lbs.) P = Belt weight (lbs./linear ft.) Q = Weight of rotating parts in pounds per foot of length of belt conveyor R = Weight in pounds of conveyed product per foot of belt conveyor length C = Co-efficient of friction between conveyor belt and top slider bed L = Center to center length (feet) H = Height (feet)</p>
 Roller bed conveyor	$F_0 = 0.04 (2P + Q) L$	$F_1 = 0.04 \times R \times L$	$F_2 = R \times H$	
 Slider bed conveyor	$F_0 = 1.1 \times P \times L \times C$	$F_1 = 1.1 \times R \times L \times C$	$F_2 = R \times H$	

CALCULATIONS:

Table 1: Horsepower to move empty belt (for each 100 ft./min.)

Belt Width	30"	36"	42"	48"
CONVEYING LENGTH (ft.)	HORSEPOWER (hp) (per 100 ft./min.)			
50	0.64	0.8	0.96	1.16
100	0.8	1.0	1.2	1.5
200	1.1	1.4	1.7	2.2
300	1.4	1.8	2.2	2.8
400	1.8	2.2	2.6	3.4
500	2.1	2.6	3.1	4.0
600	2.4	3.0	3.6	4.6
800	3.1	3.8	4.5	5.8
1000	3.6	4.6	5.5	7.0
1400	5.2	6.5	7.9	10.4
2000	6.8	8.4	10.3	13.8
2500	8.4	10.3	12.7	17.2
3000	10.0	12.2	15.1	20.6
3500	11.6	14.1	17.5	24.0
4000	13.2	16.0	19.9	27.4
4500	14.8	17.9	22.3	30.8
5000	16.4	19.8	24.7	34.2
5500	18.0	21.7	27.1	37.6
6000	19.6	23.6	29.5	41.0
6500	21.2	25.5	31.9	44.4
7000	23.8	27.4	34.3	47.8
7500	25.4	29.3	36.7	51.2
8000	27.0	31.2	39.1	54.6
8500	28.6	33.1	41.5	58.0
9000	30.2	35.0	43.9	61.4
9500	31.8	36.9	46.3	64.8
10000	33.4	38.8	48.7	68.2

HORSEPOWER TABLES FOR BULK CONVEYORS



Table 2: Horsepower to move load horizontally (any speed, any material, any belt width)

TONS/HOUR CONVEYED	100	200	300	400	500	600	800	1000	1200	1400	1600	1800	2000
CONVEYING LENGTH (ft.)	HORSEPOWER (hp)												
50	0.25	0.5	0.75	1.0	1.25	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
100	0.5	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
200	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
300	1.5	3.0	4.5	6.0	7.5	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0
400	2.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0
500	2.5	5.0	7.5	10.0	12.5	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0
600	3.0	6.0	9.0	12.0	15.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0	60.0
800	4.0	8.0	12.0	16.0	20.0	24.0	32.0	40.0	48.0	56.0	64.0	72.0	80.0
1000	5.0	10.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100.0
1400	7.5	15.0	22.5	30.0	37.5	45.0	60.0	75.0	90.0	105.0	120.0	135.0	150.0
2000	10.0	20.0	30.0	40.0	50.0	60.0	80.0	100.0	120.0	140.0	160.0	180.0	200.0
2500	12.5	25.0	37.5	50.0	62.5	75.0	100.0	125.0	150.0	175.0	200.0	225.0	250.0
3000	15.0	30.0	45.0	60.0	75.0	90.0	120.0	150.0	180.0	210.0	240.0	270.0	300.0
3500	17.5	35.0	52.5	70.0	87.5	105.0	140.0	175.0	210.0	245.0	280.0	315.0	350.0
4000	20.0	40.0	60.0	80.0	100.0	120.0	160.0	200.0	240.0	280.0	320.0	360.0	400.0
4500	22.5	45.0	67.5	90.0	112.0	135.0	180.0	225.0	270.0	315.0	360.0	405.0	450.0
5000	25.0	50.0	75.0	100.0	125.0	150.0	200.0	250.0	300.0	350.0	400.0	450.0	500.0
5500	27.5	55.0	82.5	110.0	137.5	165.0	220.0	275.0	330.0	385.0	440.0	495.0	550.0
6000	30.0	60.0	90.0	120.0	150.0	180.0	240.0	300.0	360.0	420.0	480.0	540.0	600.0
6500	32.5	65.0	97.5	130.0	162.5	195.0	260.0	325.0	390.0	455.0	520.0	585.0	650.0
7000	35.0	70.0	105.0	140.0	175.0	210.0	280.0	350.0	420.0	495.0	560.0	630.0	700.0
7500	37.5	75.0	112.5	150.0	187.5	225.0	300.0	375.0	450.0	525.0	600.0	675.0	750.0
8000	40.0	80.0	120.0	160.0	200.0	240.0	320.0	400.0	480.0	560.0	640.0	720.0	800.0
8500	42.5	85.0	127.5	170.0	212.5	255.0	340.0	425.0	510.0	595.0	680.0	765.0	850.0
9000	45.0	90.0	135.0	180.0	225.0	270.0	360.0	450.0	540.0	630.0	720.0	810.0	900.0
9500	47.5	95.0	142.5	190.0	237.5	285.0	380.0	475.0	570.0	665.0	760.0	855.0	950.0
10000	50.0	100.0	160.0	200.0	250.0	300.0	400.0	500.0	600.0	700.0	800.0	900.0	1000.0

Table 3: Horsepower to lift load vertically - negative for downhill conveyors (any speed, any material, any belt width)

TONS/HOUR CONVEYED	100	200	300	400	500	600	800	1000	1200	1400	1600	1800	2000
LIFT (ft.)	HORSEPOWER (hp)												
10	1.14	2.28	3.42	4.56	5.7	6.84	9.12	11.4	13.68	15.96	18.24	20.52	22.8
20	2.28	4.56	6.84	9.12	11.4	13.68	18.24	22.8	27.36	31.92	36.48	41.04	45.6
30	3.42	6.84	10.26	13.68	17.1	20.52	27.36	34.2	41.04	47.88	54.72	61.56	68.4
40	4.56	9.12	13.68	18.24	22.8	27.36	36.38	45.6	54.72	63.84	72.96	82.08	91.2
50	5.7	11.4	17.1	22.8	28.5	34.2	45.6	57.0	68.4	79.8	91.2	102.6	114.0
60	6.84	13.68	20.52	27.36	34.2	41.04	54.72	68.4	82.08	95.76	109.4	123.1	136.8
70	7.98	15.96	23.94	31.92	39.9	47.88	63.84	79.8	95.76	111.7	127.7	143.6	159.6
80	9.12	18.24	27.36	36.48	45.6	54.72	72.96	91.2	109.4	127.7	145.9	164.2	182.4
90	10.26	20.52	30.78	41.04	51.3	61.56	82.08	102.6	123.1	143.6	164.2	184.7	205.2
100	11.4	22.8	34.2	45.6	57.0	68.4	91.2	114.0	136.8	159.6	182.4	205.2	228.0
150	17.1	34.2	51.3	68.4	85.5	102.6	136.8	171.0	205.2	239.4	273.6	307.8	342.0
200	22.8	45.6	68.4	91.2	114.0	136.8	182.4	228.0	273.6	319.2	364.8	410.4	456.0
250	28.5	57.0	85.5	114.0	142.5	171.0	228.0	285.0	342.0	399.0	456.0	513.0	570.0
300	34.2	68.4	102.6	136.8	171.0	205.2	273.6	342.0	410.4	478.8	547.2	615.6	684.0
350	39.9	79.8	119.6	159.6	200.0	239.4	319.2	399.0	478.8	558.5	638.4	718.0	798.0
400	45.6	91.2	136.8	182.4	228.0	273.6	364.8	456.0	547.2	638.4	729.6	820.8	912.0
450	51.3	102.6	153.9	205.4	256.5	307.8	410.4	513.0	615.6	718.0	820.0	923.5	1026.0
500	57.0	114.0	171.0	228.0	285.0	342.0	456.0	570.0	684.0	798.0	912.0	1026.0	1140.0
600	68.4	136.8	205.2	273.6	342.0	410.4	547.2	684.0	820.8	957.6	1094.0	1231.0	1368.0
700	79.8	159.6	239.4	319.2	399.0	478.8	638.4	798.0	957.6	1117.0	1277.0	1436.0	1596.0
800	91.2	182.4	273.6	364.8	456.0	547.2	729.6	912.0	1094.0	1277.0	1459.0	1642.0	1824.0
900	102.6	205.2	307.8	410.4	513.0	615.6	820.8	1026.0	1231.0	1436.0	1642.0	1847.0	2052.0
1000	114.0	228.0	342.0	456.0	570.0	684.0	912.0	1140.0	1368.0	1596.0	1824.0	2052.0	2280.0

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USA



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