Van der Graaf DRUM MOTORS

Engineered to Keep Your Business Running

TM100 - TM215 DRUM MOTORS

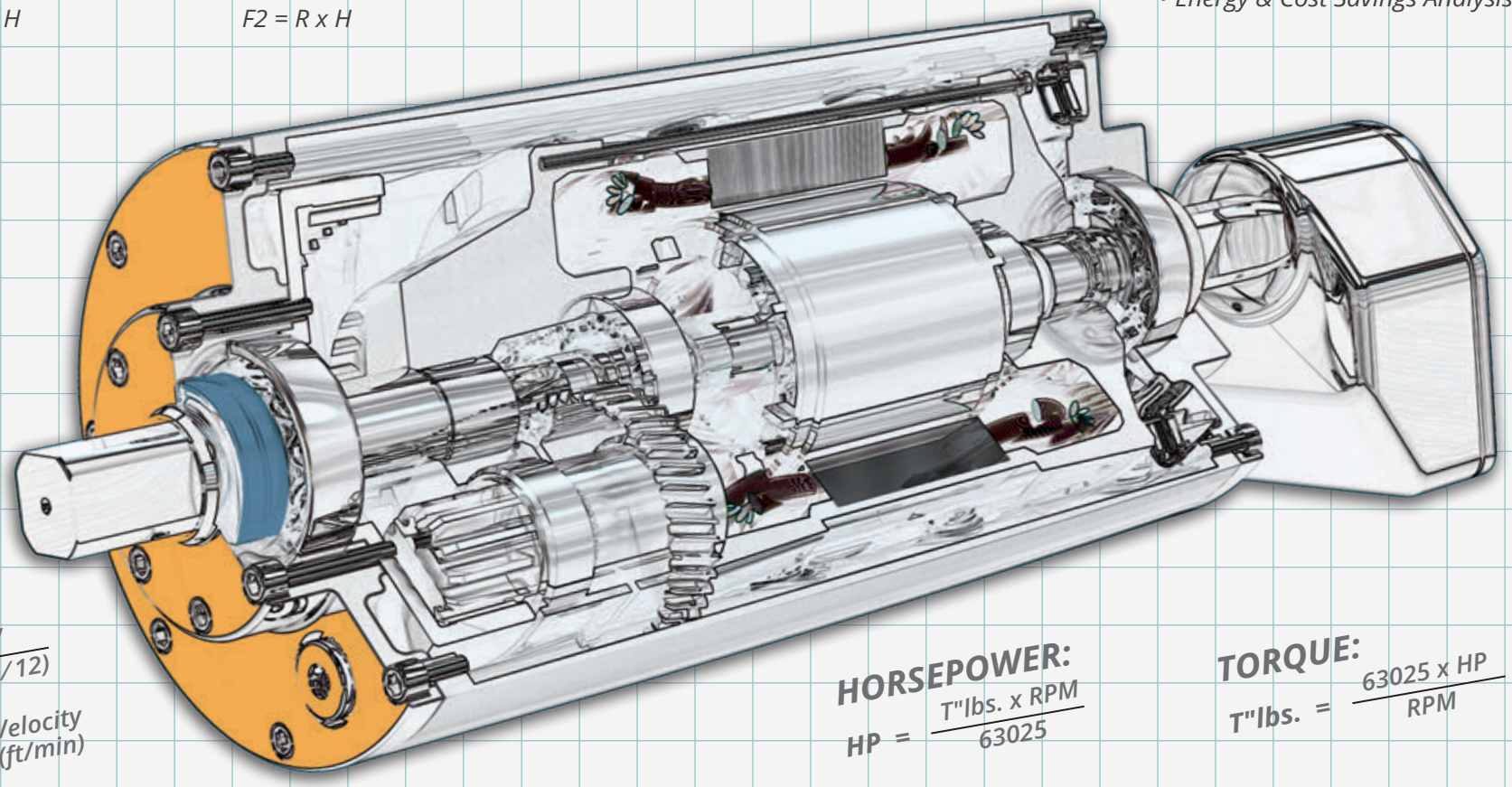
4.0" to 8.5" diameter • 0.11 to 7.5 hp

STANDARD-DUTY

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

Roller Bed Conveyor	Slider Bed Conveyor
F0 = 0.04 (2P + Q) L	F0 = 1.1 x P x L x C
F1 = 0.04 x R x L	F1 = 1.1 x R x L x C
F2 = R X H	F2 = R x H

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



RPM:

$$= \frac{V}{\Pi\,(d/12)}$$

V = Velocity (ft/min)

HORSEPOWER:

$$HP = \frac{T"lbs. \times RPM}{63025}$$

TORQUE:

$$T"lbs. = \frac{63025 \times HP}{RPM}$$

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Drum Motor Series		Dimensions	Specifictions
TM100	(4.0" ø; 0.25 - 0.11 hp)	5	6-7
TM113	(4.5" ø; 0.5 - 0.16 hp)	8	9-10
TM127	(5.0" ø; 1.5 - 0.25 hp)	11	12
TM138	(5.4" ø; 1.5 - 0.25 hp)	13	14
TM160	(6.5" ø; 3.0 - 0.75 hp)	15	16
TM215	(8.5" ø; 7.5 - 2.0 hp)	17	18

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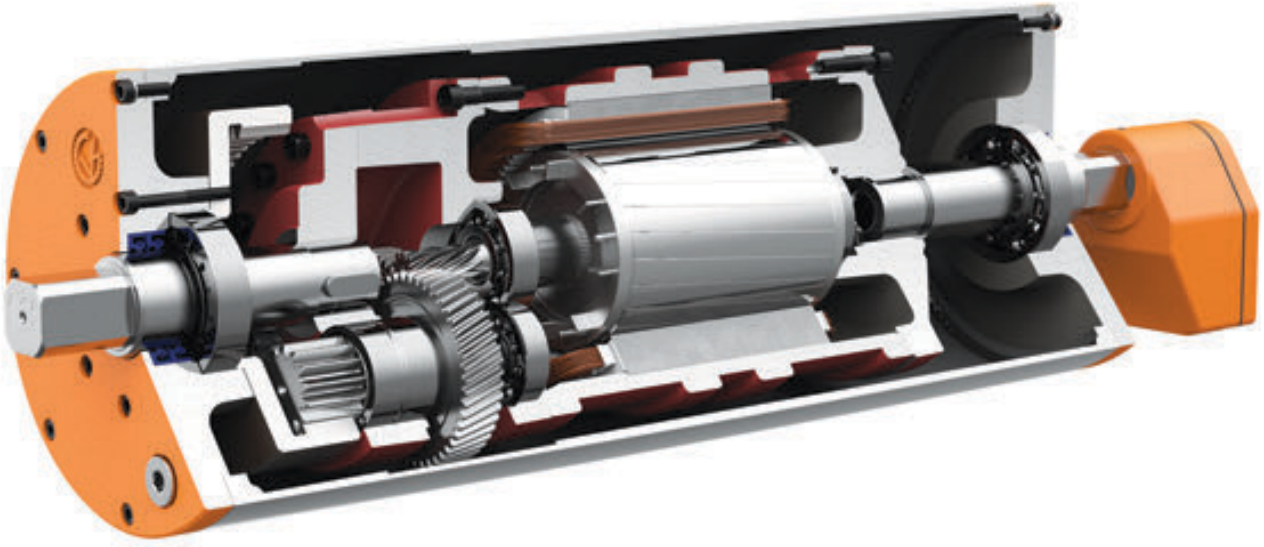
DESIGN BENEFITS

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.

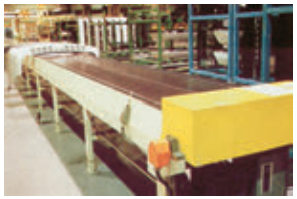
The rugged design of the Van der Graaf drum motor provides the end user with a quieter environment, space savings, efficiency and reliability with virtually no maintenance.

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



Drum motors are available in 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 21-22

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STANDARD FEATURES

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

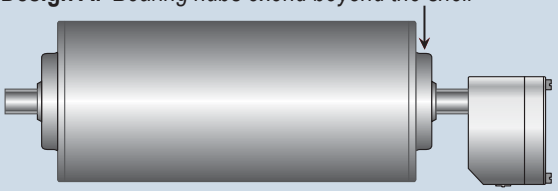
The drum motor can be supplied in all standard voltage and all other nonstandard voltage and frequency for three phase or single phase applications.

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.

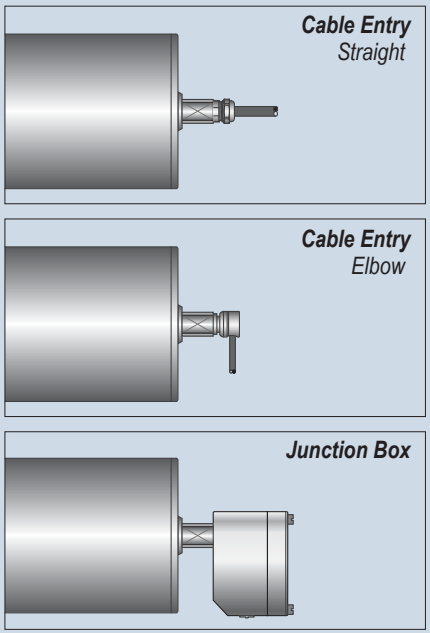
HUB DESIGN:

Design A: *Bearing hubs exend beyond the shell*



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

POWER HOOK-UP:



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OPTIONS

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.

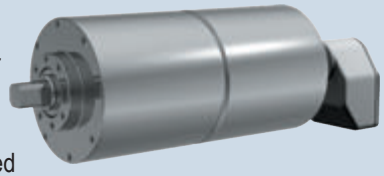
NO BELT (NB) OPERATION
No Belt design series drum motor is recommended for applications when the drum motor is required to run without a belt or using modular belting.
The NB series drum motor should be specified when:

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.

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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.

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.







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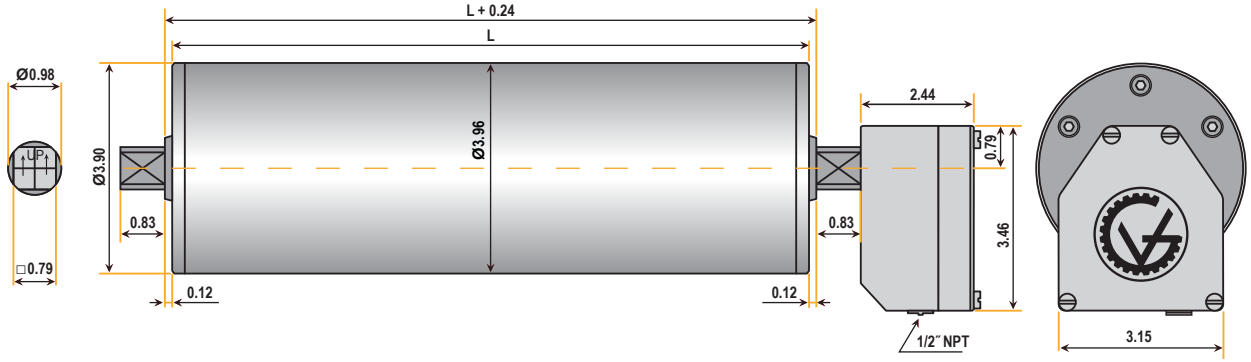
TM100B25 Drum Motor (matching Idler KT100B25**)

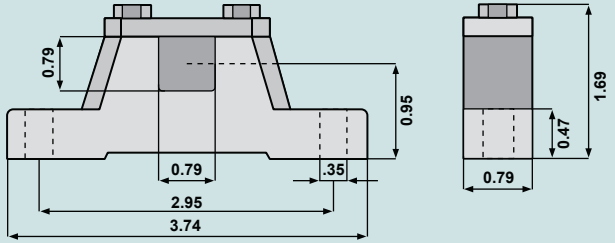


Standard drum motor face widths* (L) in inches:

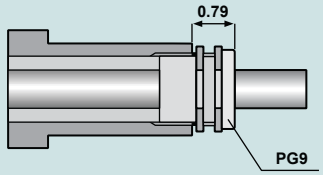
10.24	10.83	12.20	14.17	16.14	18.11	20.08	22.05	24.02
25.98	27.95	29.92	31.89	33.86	35.83	37.80	39.76	41.73
43.70	45.67							

Some face widths are not available in all horsepowers. For minimum available face widths refer to page 19.
**Idler dimensions are identical to the drum motor with no junction box.*

Bracket AB 20



Optional Cable Type



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

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0.25 HP

V *(ft/min)* M/G	409 4/S2	327 4/S2	291 4/S2	258 4/S2	227 4/S2	199 4/S2	177 4/PL2	157 4/PL2	149 4/PL2	132 4/PL2	111 4/PL2	106 4/PL2	93 4/PL2	83 4/PL2	69 4/PL2
Belt Pull *(lbs)*	20	25	28	32	36	41	47	52	55	63	74	78	88	100	119
Drum RPM	397	317	282	250	220	193	172	152	145	128	108	103	90	81	67

V *(ft/min)* M/G	56 4/PL2	44 4/PL3	37 4/PL3	33 4/PL3	27 4/PL3	23 4/PL3	20 4/PL3	17 4/PL3	14 4/PL3
Belt Pull *(lbs)*	148	189	225	253	274	274	274	274	274
Drum RPM	54	43	36	32	26	22	19	17	14

0.16 HP

V *(ft/min)* M/G	258 4/S2	227 4/S2	199 4/S2	177 4/PL2	157 4/PL2	149 4/PL2	132 4/PL2	111 4/PL2	106 4/PL2	93 4/PL2	83 4/PL2	69 4/PL2	56 4/PL2	44 4/PL3	37 4/PL3
Belt Pull *(lbs)*	20	23	27	30	34	35	40	48	50	57	64	76	94	121	144
Drum RPM	250	220	193	172	152	145	128	108	103	90	81	67	54	43	36

V *(ft/min)* M/G	33 4/PL3	27 4/PL3	23 4/PL3	20 4/PL3	17 4/PL3	14 4/PL3
Belt Pull *(lbs)*	162	193	230	259	274	274
Drum RPM	32	26	22	19	17	14

0.16 HP

V *(ft/min)* M/G	305 6/S2	273 6/S2	218 6/S2	194 6/S2	172 6/S2	152 6/S2	105 6/PL2	99 6/PL2	88 6/PL2	74 6/PL2	71 6/PL2	62 6/PL2	55 6/PL2	46 6/PL2	37 6/PL2
Belt Pull *(lbs)*	17	19	24	27	31	35	50	53	60	71	74	85	96	114	142
Drum RPM	296	265	212	188	167	148	102	96	85	72	69	60	53	45	36

V *(ft/min)* M/G	29 6/PL3	24 6/PL3	22 6/PL3	18 6/PL3	15 6/PL3	13 6/PL3	11 6/PL3	9 6/PL3
Belt Pull *(lbs)*	181	216	243	274	274	274	274	274
Drum RPM	28	23	21	17	15	13	11	9

0.14 HP

V *(ft/min)* M/G	258 4/S2	227 4/S2	199 4/S2	177 4/PL2	157 4/PL2	149 4/PL2	132 4/PL2	111 4/PL2	106 4/PL2	93 4/PL2	83 4/PL2	69 4/PL2	56 4/PL2	44 4/PL3	37 4/PL3
Belt Pull *(lbs)*	18	20	23	26	29	31	35	42	42	50	56	67	83	106	126
Drum RPM	250	220	193	172	152	145	128	108	103	90	81	67	54	43	36

V *(ft/min)* M/G	33 4/PL3	27 4/PL3	23 4/PL3	20 4/PL3	17 4/PL3	14 4/PL3
Belt Pull *(lbs)*	142	169	201	227	271	274
Drum RPM	32	26	22	19	17	14

V = ***Belt Speed*** *(ft/min)*

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

High Speed Low Torque ◀ 2/S2 4/S2 6/S2 2/S3 4/S3 6/S3 2/PL2 4/PL2 6/PL2 2/PL3 4/PL3 6/PL3 ▶ *Low Speed High Torque*

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0.11 HP

V *(ft/min)* M/G	194 6/S2	172 6/S2	151 6/S2	118 6/PL2	105 6/PL2	99 6/PL2	88 6/PL2	74 6/PL2	71 6/PL2	62 6/PL2	55 6/PL2	46 6/PL2	37 6/PL2	29 6/PL3	24 6/PL3
Belt Pull *(lbs)*	19	21	24	31	35	36	41	49	51	58	66	79	97	125	148
Drum RPM	188	167	147	115	102	96	85	72	69	60	53	45	36	28	23

V *(ft/min)* M/G	22 6/PL3	18 6/PL3	15 6/PL3	13 6/PL3	11 6/PL3	9 6/PL3
Belt Pull *(lbs)*	167	200	237	267	274	274
Drum RPM	21	17	15	13	11	9

V = ***Belt Speed*** *(ft/min)*

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

High Speed Low Torque ◀ 2/S2 4/S2 6/S2 2/S3 4/S3 6/S3 2/PL2 4/PL2 6/PL2 2/PL3 4/PL3 6/PL3 ▶ *Low Speed High Torque*

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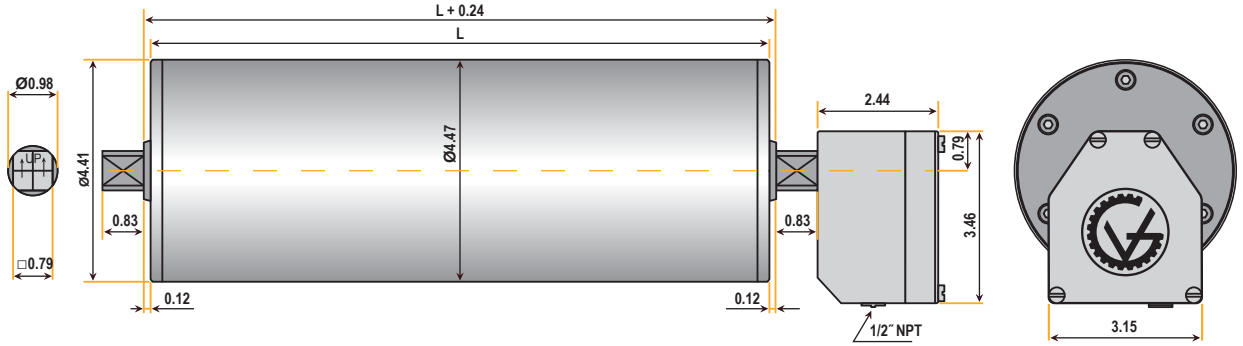
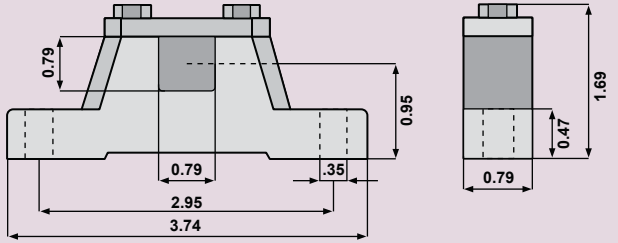
TM113B25 Drum Motor (matching Idler KT113B25**)



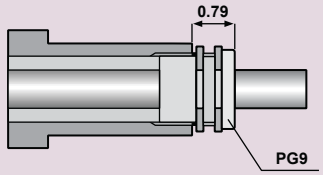
Standard drum motor face widths* (L) in inches:

10.24	10.83	12.20	14.17	16.14	18.11	20.08	22.05	24.02
25.98	27.95	29.92	31.89	33.86	35.83	37.80	39.76	41.73
43.70	45.67							

Bracket AB 20



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 horsepowers. For minimum available face widths refer to page 19.*
***Idler dimensions are identical to the drum motor with no junction box.*

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0.75 HP

V *(ft/min)* M/G	1039 2/S2	945 2/S2	756 2/S2	661 2/S2	591 2/S2	520 2/S2	449 2/S2
Belt Pull *(lbs)*	22	24	31	35	39	45	50
Drum RPM	1211	1100	880	770	688	605	523

0.5 HP

V *(ft/min)* M/G	1039 2/PL2	945 2/S2	756 2/S2	661 2/S2	591 2/S2
Belt Pull *(lbs)*	15	17	21	23	26
Drum RPM	1211	1100	880	770	688

0.5 HP

V *(ft/min)* M/G	520 4/S2	472 4/S2	378 4/S2	331 4/S2	295 4/S2	260 4/S2	224 4/S2	201 4/PL2	177 4/S2	165 4/PL2	154 4/PL2	142 4/S2	130 4/PL2	118 4/PL2	106 4/PL2
Belt Pull *(lbs)*	30	33	41	47	52	60	69	75	88	91	98	109	116	127	141
Drum RPM	605	550	440	385	344	303	261	234	206	193	179	165	151	138	124

V *(ft/min)* M/G	94 4/PL2	80 4/PL2	64 4/PL2
Belt Pull *(lbs)*	161	187	215
Drum RPM	110	94	74

0.34 HP

V *(ft/min)* M/G	1039 2/S2	945 2/S2	756 2/S2	661 2/S2	591 2/S2	520 2/S2	449 2/S2	378 2/S2	331 2/S2	295 2/S2	260 2/S2	224 2/S2	201 2/PL2	177 2/PL2	165 2/PL2
Belt Pull *(lbs)*	10	11	14	16	18	21	24	28	32	36	40	47	50	57	62
Drum RPM	1211	1100	880	770	688	605	523	440	385	344	303	261	234	206	193

V *(ft/min)* M/G	154 2/PL2	142 2/S2	130 2/PL2	118 2/PL2	106 2/PL2	94 2/PL2	80 2/PL2	64 2/PL2							
Belt Pull *(lbs)*	66	79	86	95	108	126	159								
Drum RPM	179	151	138	124	110	94	74								

0.34 HP

V *(ft/min)* M/G	520 4/S2	472 4/S2	378 4/S2	331 4/S2	295 4/S2	260 4/S2	224 4/S2	201 4/PL2	177 4/PL2	165 4/PL2	154 4/PL2	130 4/PL2	118 4/PL2	106 4/PL2	94 4/PL2
Belt Pull *(lbs)*	21	22	28	32	36	40	47	50	57	62	66	79	86	95	108
Drum RPM	605	550	440	385	344	303	261	234	206	193	179	151	138	124	110

V *(ft/min)* M/G	80 4/PL2	64 4/PL2
Belt Pull *(lbs)*	126	159
Drum RPM	94	74

V = ***Belt Speed*** *(ft/min)*

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

High Speed Low Torque ◀ 2/S2 · 4/S2 · 6/S2 · 2/S3 · 4/S3 · 6/S3 · 2/PL2 · 4/PL2 · 6/PL2 · 2/PL3 · 4/PL3 · 6/PL3 ▶ *Low Speed High Torque*

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0.34 HP

V *(ft/min)* M/G	236 6/S2	213 6/S2	189 6/S2	165 6/S2	142 6/S2	118 6/S2	94 6/S2	69 6/PL2	59 6/PL2	50 6/PL2	40 6/PL2
Belt Pull *(lbs)*	45	50	55	64	74	89	111	149	172	205	215
Drum RPM	275	248	220	193	165	138	110	80	69	58	47

0.25 HP

V *(ft/min)* M/G	378 4/S2	331 4/S2	295 4/S2	260 4/S2	224 4/S2	201 4/PL2	177 4/PL2	165 4/PL2	154 4/PL2	130 4/PL2	118 4/PL2	106 4/PL2	94 4/PL2	80 4/PL2	64 4/PL2
Belt Pull *(lbs)*	20	22	25	29	34	36	41	44	48	56	62	69	78	91	115
Drum RPM	440	385	344	303	261	234	206	193	179	151	138	124	110	94	74

V *(ft/min)* M/G	47 4/PL3	43 4/PL3	38 4/PL3	31 4/PL3	26 4/PL3
Belt Pull *(lbs)*	148	165	185	215	215
Drum RPM	55	50	44	36	30

0.25 HP

V *(ft/min)* M/G	213 6/S2	189 6/S2	165 6/S2	142 6/S2	59 6/PL2	50 6/PL2	40 6/PL2
Belt Pull *(lbs)*	36	40	46	53	123	148	182
Drum RPM	248	220	193	165	69	58	47

0.16 HP

V *(ft/min)* M/G	260 4/S2	224 4/S2	201 4/PL2	177 4/PL2	165 4/PL2	154 4/PL2	130 4/PL2	118 4/PL2	106 4/PL2	94 4/PL2	80 4/PL2	64 4/PL2	43 4/PL3	26 4/PL3	17 4/PL3
Belt Pull *(lbs)*	20	22	24	27	30	32	37	41	46	51	61	77	109	180	215
Drum RPM	303	261	234	206	193	179	151	138	124	110	94	74	50	30	19

V = ***Belt Speed*** *(ft/min)*

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

High Speed Low Torque ◀ 2/S2 | 4/S2 | 6/S2 | 2/S3 | 4/S3 | 6/S3 | 2/PL2 | 4/PL2 | 6/PL2 | 2/PL3 | 4/PL3 | 6/PL3 ▶ *Low Speed High Torque*

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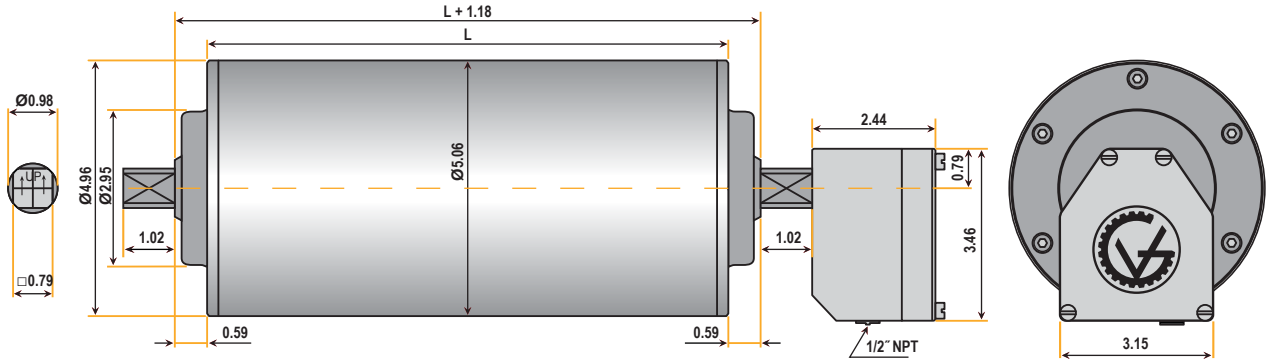
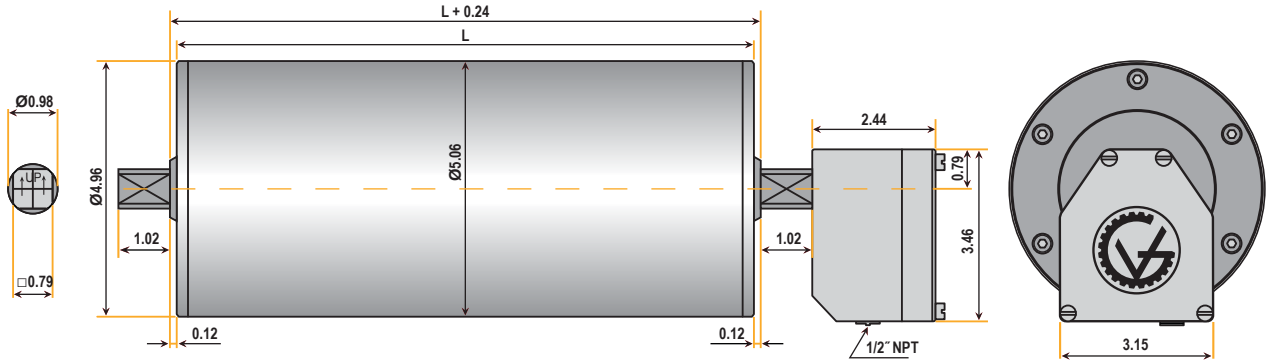
TM127A25 Drum Motor (matching Idler KT127A25**)



Standard face widths* (L) in inches:

9.84	10.83	11.81	13.78	15.75	17.72	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						

TM127B25 Drum Motor (matching Idler KT127B25**)

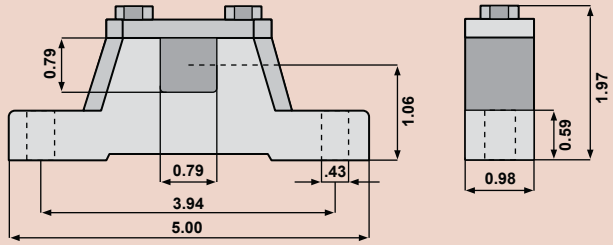


Standard face widths* (L) in inches:

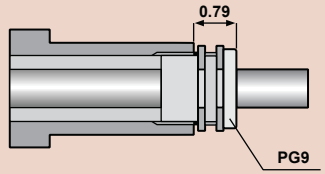
10.83	11.81	13.78	15.75	17.72	19.69	21.65	23.62	25.59
27.56	29.53	31.50	33.46	35.43	37.40	39.37	41.34	43.31
45.28	47.24							

**Some face widths are not available in all horsepowers. For minimum available face widths refer to page 19.*
***Idler dimensions are identical to the drum motor with no junction box.*

Bracket AB 25



Optional Cable Type



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

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1.5 HP

V *(ft/min)* **M/G**	316 4/S2	237 4/S2	201 4/S2	124 4/S2
Belt Pull *(lbs)*	156	207	244	396
Drum RPM	243	182	155	95

1.0 HP

V *(ft/min)* **M/G**	646 2/S2	484 2/S2	411 2/S2	316 4/S2	237 4/S2	201 4/S2	147 4/S2	124 4/S2	110 4/S2	73 4/PL2	58 4/PL2	49 4/PL2	38 4/PL2
Belt Pull *(lbs)*	51	68	80	104	138	163	223	264	298	449	565	669	767
Drum RPM	497	372	316	243	182	155	113	95	85	56	45	38	29

0.75 HP

V *(ft/min)* **M/G**	651 2/S2	488 2/S2	414 2/S2	328 4/S2	246 4/S2	209 4/S2	152 4/S2	134 4/S3	114 4/S2	97 4/S2	87 6/S2	74 6/S2	62 4/S3	56 4/S3	50 4/PL2
Belt Pull *(lbs)*	38	50	59	75	100	118	162	183	216	253	282	332	366	408	491
Drum RPM	501	375	318	252	189	161	117	103	88	75	67	57	48	43	38

V *(ft/min)* **M/G**	40 4/PL2
Belt Pull *(lbs)*	614
Drum RPM	31

0.5 HP

V *(ft/min)* **M/G**	321 4/S2	241 4/S2	205 4/S2	149 4/S2	131 4/S2	98 4/S2	83 4/S2	64 6/S2	54 4/S3	41 4/S3	33 6/PL2	26 6/PL2
Belt Pull *(lbs)*	51	68	80	110	125	167	197	256	303	400	496	630
Drum RPM	247	185	158	115	101	75	64	49	42	32	25	20

0.34 HP

V *(ft/min)* **M/G**	322 4/S2	241 4/S2	205 4/S2	149 4/S2	131 4/S2	99 4/S2	84 4/S2	61 4/S3	54 4/S3	41 4/S3
Belt Pull *(lbs)*	35	46	54	75	85	113	133	183	206	272
Drum RPM	248	185	158	115	101	76	65	47	42	32

0.25 HP

V *(ft/min)* **M/G**	11.1 4/PL3	8.7 4/PL3	7.3 4/PL3	5.8 4/PL3
Belt Pull *(lbs)*	738	767	767	767
Drum RPM	8.5	6.7	5.6	4.5

V = ***Belt Speed*** *(ft/min)*

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

High Speed Low Torque ◀ 2/S2 | 4/S2 | 6/S2 | 2/S3 | 4/S3 | 6/S3 | 2/PL2 | 4/PL2 | 6/PL2 | 2/PL3 | 4/PL3 | 6/PL3 ▶ *Low Speed High Torque*

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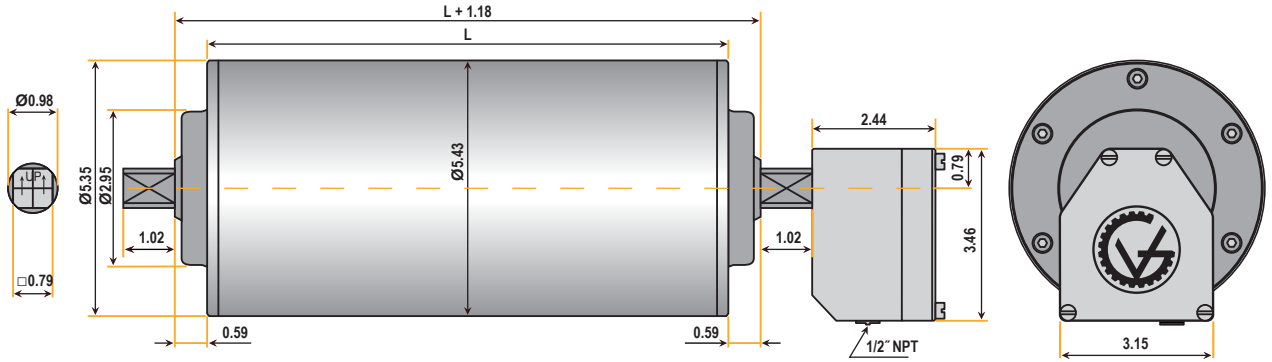
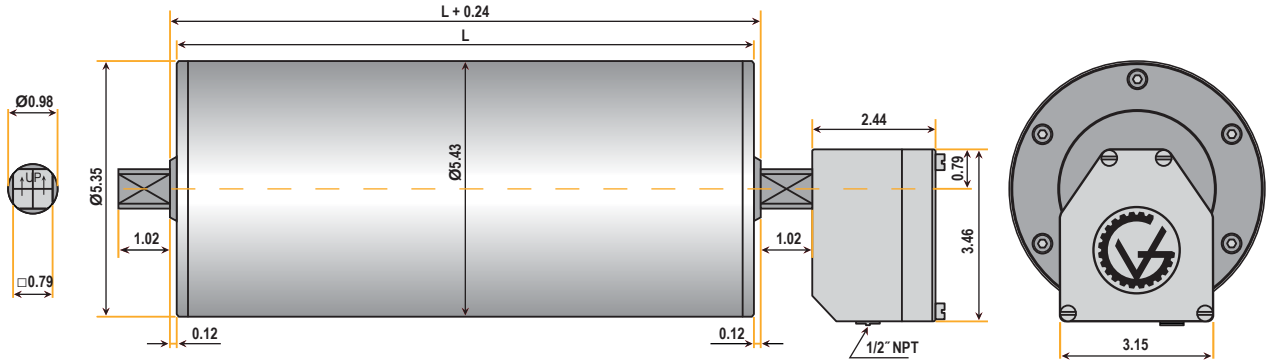
TM138A25 Drum Motor (matching Idler KT138A25**)



Standard face widths* (L) in inches:

9.84	10.83	11.81	13.78	15.75	17.72	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						

TM138B25 Drum Motor (matching Idler KT138B25**)

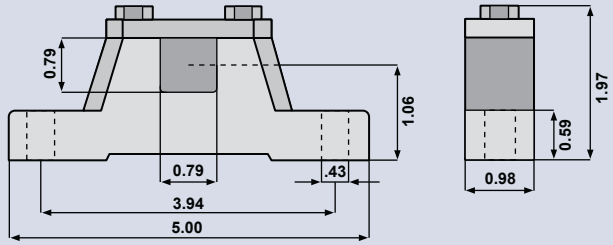


Standard face widths* (L) in inches:

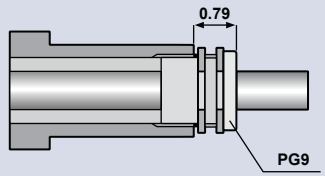
10.83	11.81	13.78	15.75	17.72	19.69	21.65	23.62	25.59
27.56	29.53	31.50	33.46	35.43	37.40	39.37	41.34	43.31
45.28	47.24							

**Some face widths are not available in all horsepowers. For minimum available face widths refer to page 19.*
***Idler dimensions are identical to the drum motor with no junction box.*

Bracket AB 25



Optional Cable Type



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

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1.5 HP

V *(ft/min)* **M/G**	343 4/S2	258 4/S2	218 4/S2	135 4/S2
Belt Pull *(lbs)*	156	208	246	398
Drum RPM	242	181	154	95

1.0 HP

V *(ft/min)* **M/G**	702 2/S2	526 2/S2	447 2/S2	343 4/S2	258 4/S2	218 4/S2	160 4/S2	135 4/S2	120 4/S2	79 4/PL2	63 4/PL2	53 4/PL2	41 4/PL2
Belt Pull *(lbs)*	51	68	80	104	139	164	224	266	299	451	568	672	767
Drum RPM	494	370	315	242	181	154	112	95	84	56	44	37	29

0.75 HP

V *(ft/min)* **M/G**	707 2/S2	530 2/S2	450 2/S2	356 4/S2	267 4/S2	227 4/S2	165 4/S2	146 4/S3	124 4/S2	105 4/S2	95 6/S2	80 6/S2	67 4/S3	61 4/S3	54 4/PL2
Belt Pull *(lbs)*	38	51	60	75	100	118	162	184	217	255	284	334	398	441	494
Drum RPM	498	373	317	251	188	160	116	103	87	74	67	57	47	43	38

V *(ft/min)* **M/G**	43 4/PL2
Belt Pull *(lbs)*	617
Drum RPM	31

0.5 HP

V *(ft/min)* **M/G**	349 4/S2	262 4/S2	223 4/S2	162 4/S2	142 4/S2	106 4/S2	90 4/S2	70 6/S2	59 4/S3	45 4/S3	42 4/PL2	36 6/PL2	28 6/PL2
Belt Pull *(lbs)*	51	68	80	111	126	168	198	257	305	402	422	499	633
Drum RPM	246	184	157	114	100	75	64	49	41	31	30	25	20

0.34 HP

V *(ft/min)* **M/G**	350 4/S2	262 4/S2	223 4/S2	162 4/S2	142 4/S2	108 4/S2	91 4/S2	66 4/S3	59 4/S3	45 4/S3
Belt Pull *(lbs)*	35	46	55	75	85	113	133	184	207	273
Drum RPM	246	184	157	114	100	76	64	47	41	31

0.25 HP

V *(ft/min)* **M/G**	12 4/PL3	9 4/PL3	8 4/PL3	6 4/PL3
Belt Pull *(lbs)*	742	767	767	767
Drum RPM	8	7	6	4

V = ***Belt Speed*** *(ft/min)*

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

High Speed Low Torque ◀ 2/S2 4/S2 6/S2 2/S3 4/S3 6/S3 2/PL2 4/PL2 6/PL2 2/PL3 4/PL3 6/PL3 ▶ *Low Speed High Torque*

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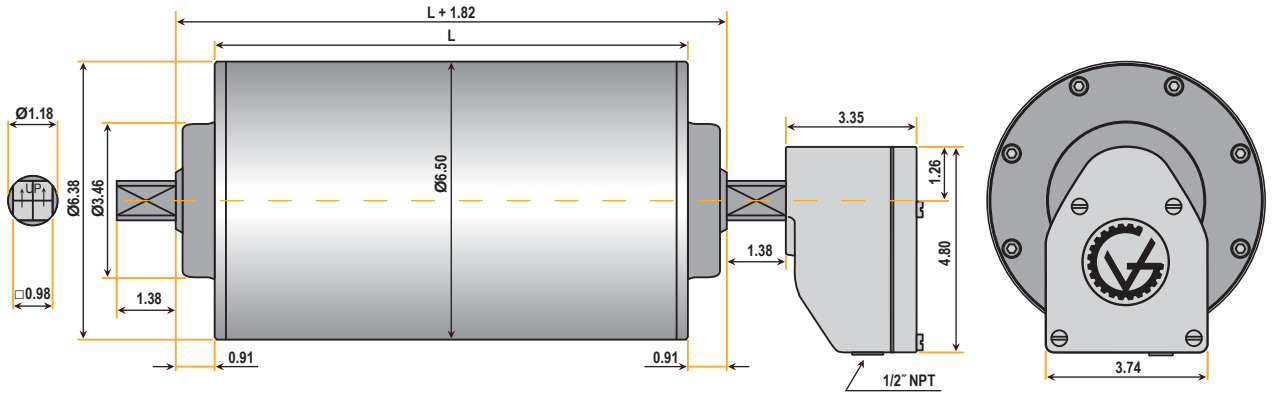
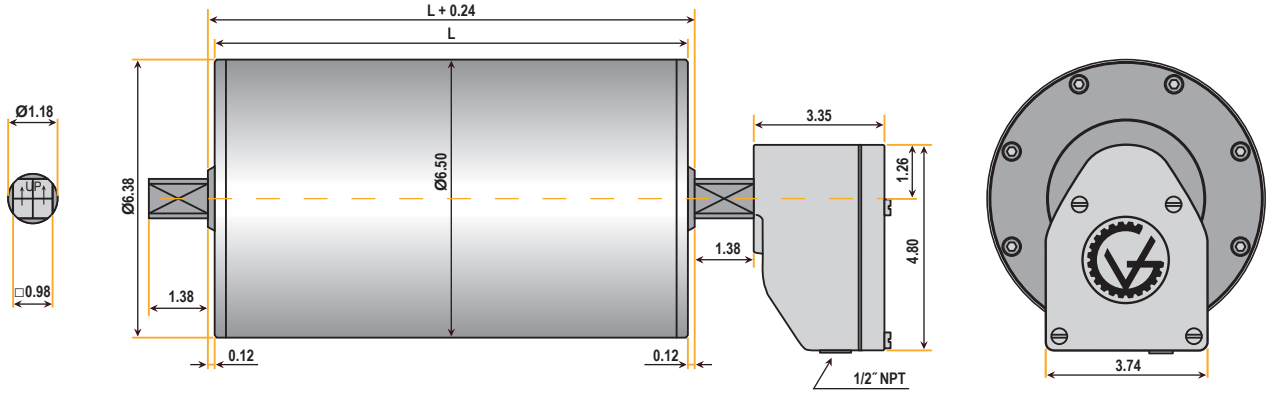
TM160A30 Drum Motor (matching Idler KT160A30**)



Standard face widths* (L) in inches:

13.78	15.75	16.73	17.72	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								

TM160B30 Drum Motor (matching Idler KT160B30**)

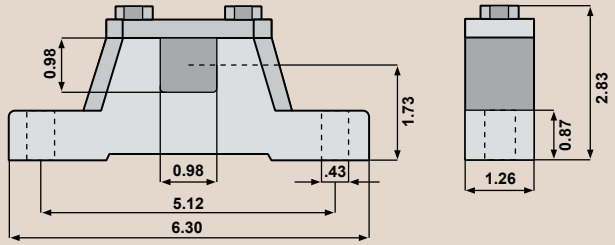


Standard face widths* (L) in inches:

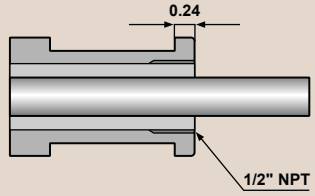
15.75	16.73	17.72	19.69	21.65	23.62	25.59	27.56	29.53
31.50	33.46	35.43	37.40	39.37	41.34	43.31	45.28	47.24

**Some face widths are not available in all horsepowers. For minimum available face widths refer to page 19.*
***Idler dimensions are identical to the drum motor with no junction box.*

Bracket AB 30



Optional Cable Type



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

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3.0 HP

V *(ft/min)* **M/G**	945 2/S2	803 2/S2	661 2/S2	614 2/S2	496 2/S2	402 2/S2	331 2/S2	307 2/S2	283 2/S2	272 2/S2	236 2/S2	213 2/S2	201 2/S2	189 2/S2	
Belt Pull *(lbs)*	97	152	139	151	186	230	280	301	325	339	391	434	460	488	
Drum RPM	556	472	389	361	292	236	195	181	167	160	139	125	118	111	

2.0 HP

V *(ft/min)* **M/G**	945 2/S2	803 2/S2	661 2/S2	614 2/S2	591 4/S2	496 4/S2	425 4/S2	402 2/S2	378 4/S2	331 2/S2	307 4/S2	283 2/S2	272 2/S2	260 4/S2	236 2/S2
Belt Pull *(lbs)*	66	79	95	103	107	127	148	157	166	191	205	223	232	242	266
Drum RPM	556	472	389	361	347	292	250	236	222	195	181	167	160	153	139

V *(ft/min)* **M/G**	213 2/S2	201 4/S2	189 4/S2	177 4/S2	165 4/S2	154 4/S2	142 4/S2	130 4/S2	108 2/PL2	87 2/PL2					
Belt Pull *(lbs)*	296	313	333	355	381	410	444	484	560	560					
Drum RPM	125	118	111	104	97	90	83	76	64	51					

1.5 HP

V *(ft/min)* **M/G**	472 4/S2	402 4/S2	331 4/S2	295 4/S2	260 4/S2	201 4/S2	165 4/S2	154 4/S2	142 4/S2	130 4/S2	118 4/S2	106 4/S2	94 4/S2		
Belt Pull *(lbs)*	98	115	139	156	178	230	280	301	325	355	391	434	489		
Drum RPM	278	236	195	174	153	118	97	90	83	76	69	63	56		

1.0 HP

V *(ft/min)* **M/G**	472 4/S2	402 4/S2	331 4/S2	295 4/S2	260 4/S2	201 4/S2	177 4/S2	165 4/S2	154 4/S2	142 4/S2	130 4/S2	118 4/S2	106 4/S2	94 4/S2	80 4/S2
Belt Pull *(lbs)*	66	79	95	107	122	157	178	191	205	223	242	266	296	333	392
Drum RPM	278	236	195	174	153	118	104	97	90	83	76	69	63	56	47

V *(ft/min)* **M/G**	54 4/PL2														
Belt Pull *(lbs)*	561														
Drum RPM	32														

0.75 HP

V *(ft/min)* **M/G**	472 4/S2	402 4/S2	331 4/S2	295 4/S2	260 4/S2	201 4/S2	177 4/S2	165 4/S2	130 4/S2	154 4/S2	118 4/S2	106 4/S2	94 4/S2	80 4/S2	73 4/S2
Belt Pull *(lbs)*	49	57	70	79	89	115	130	139	178	150	195	217	244	287	315
Drum RPM	278	236	195	174	153	118	104	97	76	90	69	63	56	47	43

V *(ft/min)* **M/G**	43 4/PL2														
Belt Pull *(lbs)*	525														
Drum RPM	25														

V = ***Belt Speed*** *(ft/min)*

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

High Speed Low Torque ◀ 2/S2 · 4/S2 · 6/S2 · 2/S3 · 4/S3 · 6/S3 · 2/PL2 · 4/PL2 · 6/PL2 · 2/PL3 · 4/PL3 · 6/PL3 ▶ *Low Speed High Torque*

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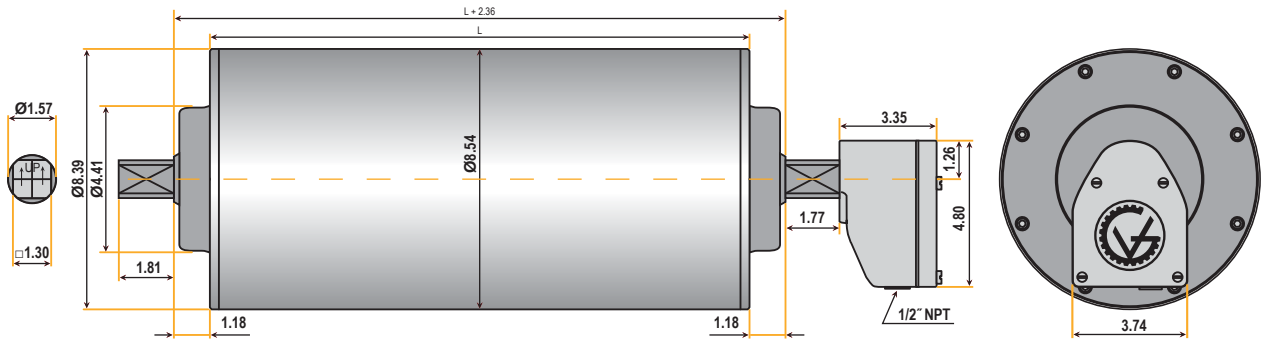
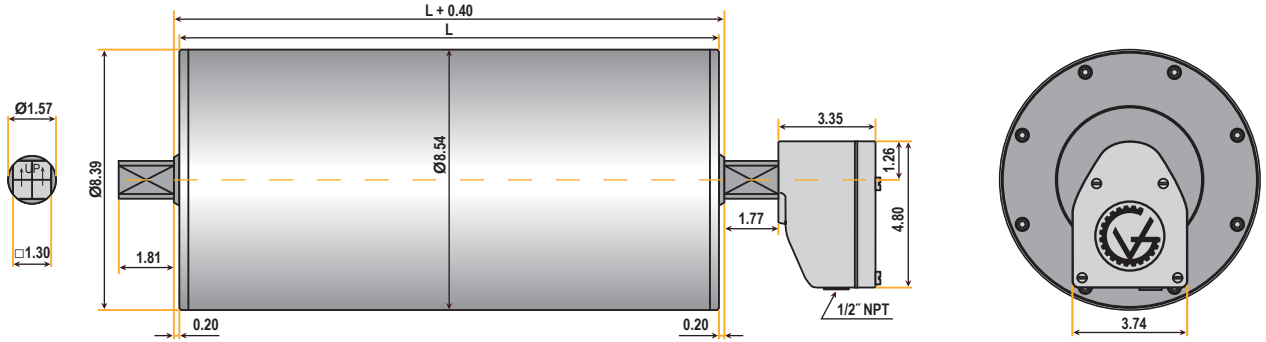
TM215A40 Drum Motor (matching Idler KT215A40**)



Standard face widths* (L) in inches:

16.73	17.72	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	

TM215B40 Drum Motor (matching Idler KT215B40**)

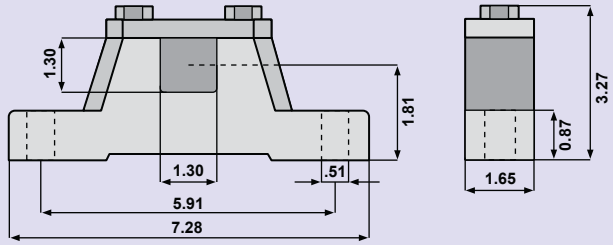


Standard face widths* (L) in inches:

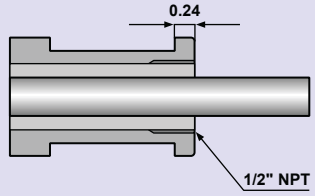
19.69	21.65	23.62	25.59	27.56	29.53	31.50	33.46	35.43
37.40	39.37	41.34	43.31	45.28	47.24			

*Some face widths are not available in all horsepowers. For minimum available face widths refer to page 19.
**Idler dimensions are identical to the drum motor with no junction box.

Bracket AB 40



Optional Cable Type



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

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7.5 HP

V *(ft/min)* M/G	1117 2/S2	912 2/S2	821 2/S2	657 2/S2	583 2/S2	547 2/S3	465 2/S2	403 2/S2	358 2/S2	335 2/S2	310 2/S2	255 2/S2	228 2/S3	142 2/PL2	129 2/PL2
Belt Pull *(lbs)*	198	243	270	337	285	405	476	549	618	662	715	651	972	1559	1714
Drum RPM	504	412	371	297	263	247	210	182	162	151	140	115	103	64	58

5.0 HP

V *(ft/min)* M/G	1117 2/S2	912 2/S2	821 2/S2	657 2/S2	583 2/S2	547 2/S3	465 2/S2	403 2/S2	358 2/S2	335 2/S2	310 2/S2	275 4/S3	255 2/S2	238 2/S2	234 4/S2
Belt Pull *(lbs)*	162	198	220	275	310	331	389	449	506	540	584	598	710	760	703
Drum RPM	503	411	370	296	263	246	209	182	161	151	140	124	115	107	105

V *(ft/min)* M/G	228 2/S3	221 2/S3	202 4/S3	198 2/S3	162 2/S3	142 2/PL2	129 2/PL2	114 4/S3	71 4/PL2	65 4/PL2
Belt Pull *(lbs)*	794	819	815	914	1117	1275	1403	1443	2317	2531
Drum RPM	103	100	91	89	73	64	58	51	32	29

3.0 HP

V *(ft/min)* M/G	679 4/S2	559 4/S2	483 4/S2	398 4/S2	325 4/S2	293 4/S2	233 4/S2	234 4/S2	208 4/S2	202 4/S2	166 4/S2	155 4/S2	144 4/S2	128 4/S2	119 4/S2
Belt Pull *(lbs)*	130	158	183	222	272	302	379	377	425	437	533	569	614	692	741
Drum RPM	307	253	218	180	147	132	105	106	94	91	75	70	65	58	54

V *(ft/min)* M/G	114 4/S3	99 4/S3	81 4/S3	71 4/PL2	70 4/S3	65 4/PL2	63 4/S3	47 6/PL2	43 6/PL2
Belt Pull *(lbs)*	774	893	1087	1241	1254	1365	1412	1887	2075
Drum RPM	52	45	37	32	32	29	28	21	19

2.0 HP

V *(ft/min)* M/G	685 4/S2	564 4/S2	488 2/S2	402 4/S2	376 6/S2	328 4/S2	295 4/S2	236 4/S2	210 4/S2	204 4/S2	197 6/S2	185 4/S2	167 4/S2	157 6/S2	145 4/S2
Belt Pull *(lbs)*	82	99	115	140	164	171	190	237	267	275	314	304	335	394	386
Drum RPM	309	255	220	181	170	148	133	107	95	92	89	83	76	71	65

V *(ft/min)* M/G	136 6/S2	129 4/S2	120 4/S2	111 4/S2	104 6/S2	97 6/S2	86 6/S2	77 6/S3	71 4/S3	67 6/S3	55 6/S3	48 6/PL2	47 6/S3	44 6/PL2
Belt Pull *(lbs)*	455	435	466	503	592	639	719	805	789	928	1131	1291	1304	1419
Drum RPM	61	58	54	50	47	44	39	35	32	30	25	22	21	20

V = ***Belt Speed*** *(ft/min)*

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

High Speed Low Torque ◀ 2/S2 | 4/S2 | 6/S2 | 2/S3 | 4/S3 | 6/S3 | 2/PL2 | 4/PL2 | 6/PL2 | 2/PL3 | 4/PL3 | 6/PL3 ▶ *Low Speed High Torque*

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MINIMUM FACE WIDTH (L in inches)

TM100

HP	0.25			0.16						0.14			
MOTOR/GEAR REDUCER	4/S2	4/PL2	4/PL3	4/S2	4/PL2	4/PL3	6/S2	6/PL2	6/PL3	4/S2	4/PL2	4/PL3	
HUB A min. FACE WIDTH (L)	12.20	12.20	14.17	12.20	12.20	14.17	12.20	12.20	14.17	10.24	10.24	12.20	

TM113

HP	0.75	0.5			0.34					0.25			
MOTOR/GEAR REDUCER	2/S2	2/S2	4/S2	4/PL2	2/S2	4/S2	4/PL2	6/S2	6/PL2	4/S2	4/PL2	4/PL3	
HUB A min. FACE WIDTH (L)	12.20	12.20	14.17	14.17	10.24	12.20	12.20	14.17	14.17	12.20	12.20	14.17	

TM127 / TM138

HP	1.5	1.0			0.75				0.5				0.34		0.25	
MOTOR/GEAR REDUCER	4/S2	2/S2	4/S2	4/PL2	2/S2	4/S2	4/S3	4/PL2	6/S2	4/S2	4/S3	4/PL2	4/S2	4/S3	4/PL3	
HUB A min. FACE WIDTH (L)	12.80	11.81	11.81	13.78	11.81	10.83	11.81	12.80	11.81	10.83	11.81	12.80	9.84	10.83	13.78	
HUB B min. FACE WIDTH (L)	13.78	12.80	12.80	14.76	12.80	11.81	12.80	13.78	12.80	11.81	12.80	13.78	10.83	11.81	14.76	

TM160

HP	3.0	2.0			1.5	1.0		0.75		
MOTOR/GEAR REDUCER	2/S2	2/S2	4/S2	2/PL2	4/S2	4/S2	4/PL2	4/S2	4/PL2	
HUB A min. FACE WIDTH (L)	15.75	13.78	15.75	14.76	13.78	13.78	14.76	13.78	14.76	
HUB B min. FACE WIDTH (L)	17.72	15.75	17.72	16.73	15.75	15.75	16.73	15.75	16.73	

TM215

HP	7.5			5.0						3.0				2.0			
MOTOR/GEAR REDUCER	2/S2	2/S3	2/PL2	2/S2	2/S3	2/PL2	4/S2	4/S3	4/PL2	4/S2	4/S3	4/PL2	6/PL2	4/S2	6/S2	6/S3	6/PL2
HUB A min. FACE WIDTH (L)	19.69	20.67	21.65	19.69	20.67	21.65	19.69	20.67	21.65	16.73	17.72	21.65	21.65	16.73	19.69	20.67	21.65
HUB B min. FACE WIDTH (L)	21.65	22.64	23.62	21.65	22.64	23.62	21.65	22.64	23.62	18.70	19.69	23.62	23.62	18.70	21.65	22.64	23.62

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ELECTRIC MOTOR FULL LOAD AMP

TM100

RPM	1740			1125		850
HP	0.25	0.16	0.14	0.16	0.11	0.11
Full Load Amps at: 240v	1.16	0.80	0.72	0.80	0.64	0.72
480v	0.58	0.40	0.36	0.40	0.32	0.36
600v	0.45	0.32	0.29	0.36	0.26	0.32

TM113

RPM	3400		1740				1125	850	
HP	0.5	0.34	0.5	0.34	0.25	0.16	0.25	0.16	0.11
Full Load Amps at: 240v	1.80	1.52	2.00	1.62	1.16	0.72	1.16	0.90	0.80
480v	0.90	0.76	1.00	0.81	0.58	0.36	0.58	0.45	0.40
600v	0.72	0.60	0.81	0.64	0.40	0.29	0.45	0.36	0.32

TM127 / TM138

RPM	3400			1740					1125		850		550
HP	1.0	0.75	0.5	1.5	1.0	0.75	0.5	0.34	0.75	0.5	0.5	0.34	0.18
Full Load Amps at: 240v	4.08	3.24	2.88	4.90	3.16	2.50	2.28	1.80	2.88	2.28	2.50	1.62	1.62
480v	2.04	1.62	1.44	2.45	1.58	1.25	1.14	0.90	1.44	1.14	1.25	0.81	0.81
600v	1.62	1.28	1.14	1.96	1.25	1.00	0.91	0.81	1.14	0.90	1.00	0.64	0.64

TM160

RPM	3400	1740				1125				850			550	
HP	3.0	2.0	1.5	1.0	0.75	1.0	0.75	0.5	0.34	0.75	0.5	0.34	0.18	0.18	0.13
Full Load Amps at: 240v	8.38	6.10	5.78	4.60	3.66	5.14	3.66	2.88	1.82	2.88	2.28	2.04	1.44	1.62	1.44
480v	4.19	3.05	2.89	2.30	1.83	2.57	1.83	1.44	0.91	1.44	1.14	1.02	0.72	0.81	0.72
600v	3.35	2.42	2.30	1.83	1.44	2.04	1.44	1.14	0.76	1.14	0.91	0.81	0.57	0.65	0.57

TM215

RPM	3400		1740					1125					850				550	
HP	7.5	5.5	5.0	4.0	3.0	2.0	1.5	3.0	2.0	1.5	1.0	0.75	1.5	1.0	0.75	0.5	0.75	0.5
Full Load Amps at: 240v	20.06	13.96	12.26	10.60	8.25	8.14	5.78	9.26	9.74	7.74	5.78	4.58	7.32	5.78	4.60	3.66	4.54	4.08
480v	10.03	6.98	6.13	5.30	4.13	4.07	2.89	4.63	4.87	3.87	2.89	2.29	3.66	2.89	2.30	1.83	2.27	2.04
600v	8.04	5.60	4.95	4.34	3.30	3.24	2.30	3.65	3.87	2.89	2.30	1.83	2.88	2.30	1.82	1.44	1.83	1.62

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ENERGY & COST SAVINGS ANALYSIS

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

CALCULATION
a) 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 22, 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:
$P_{1C} = P_{2C} / \eta_C = 3730/0.552 = 6757.25 \text{ W} \approx 6.757 \text{ kW}$

b) 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 22, 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:
$P_{1M} = P_{2M} / \eta_M = 3730/0.835 = 4467 \text{ W} = 4.467 \text{ kW}$

c) 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 hours/shift x 2 shift/day x 5 days/week x 52 weeks/year = 4160 hours/year.

d) **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:
$E_C = P1C \times t = 6.757 \text{ kW} \times 4160 \text{ hours/year} = 28109.12 \text{ kWh/yr}$ **≈ 28109 kWh/yr**

e) **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 kWh/yr**

f) An average price of the electric energy in USA is considered: p = 0.08 USD/kWh.

g) **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:
$C_C = E_C \times p = 28109 \text{ kWh/yr} \times 0.08 \text{ USD/kWh} = 2248.72 \text{ USD/yr}$ **≈ 2249 USD/yr**

h) **The cost of the electric energy per year of the conveyor driven by Van der Graaf drum motor** will be similrly calculated:
$C_M = E_M \times p = 18583 \text{ kWh/yr} \times 0.08 \text{ USD/kWh} = 1486.64 \text{ USD/yr}$ **≈ 1487 USD/yr**

i) 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 (See page 22, Graph 1)
$ES = E_C - E_M = 28109 \text{ kWh/yr} - 18583 \text{ kWh/yr} = 9562 \text{ kWh/yr}$

j) The cost saving per year of the higher efficient conveyor, respectively of the conveyor with Van der Graaf drum motor, is determined as a diference between the cost of the consumed energy of the convetional conveyor and the cost of the consumed energy of the conveyor drive by Van der Graaf drum motor, in the considereed opration time of one year period (See page 22, Graph 2)
$CS = C_C - C_M = 2249 \text{ UDS/yr} - 1487 \text{ USD/yr} = 762 \text{ USD/yr}$

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%.

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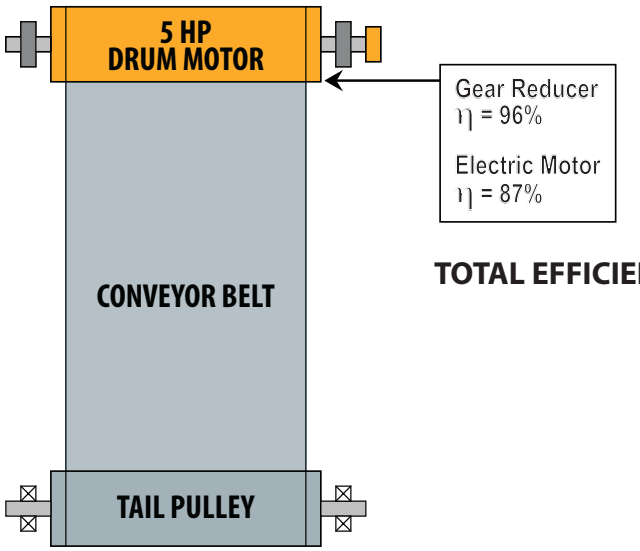
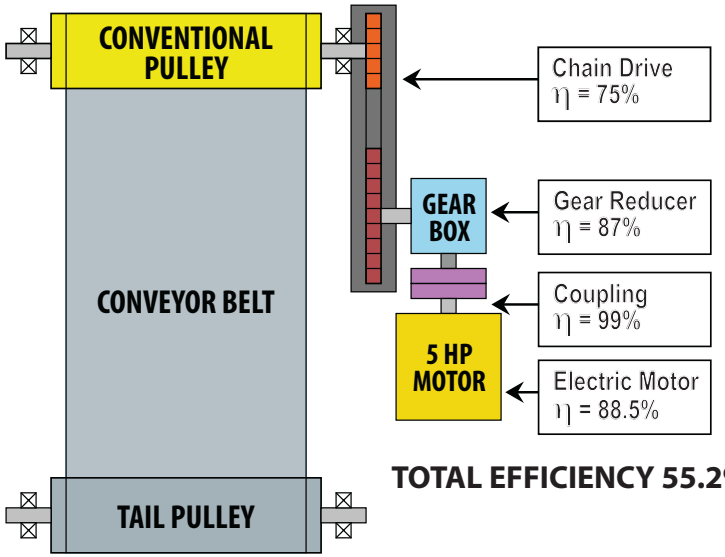
Diagram A: Conveyor Driven by a Van der Graaf Drum Motor



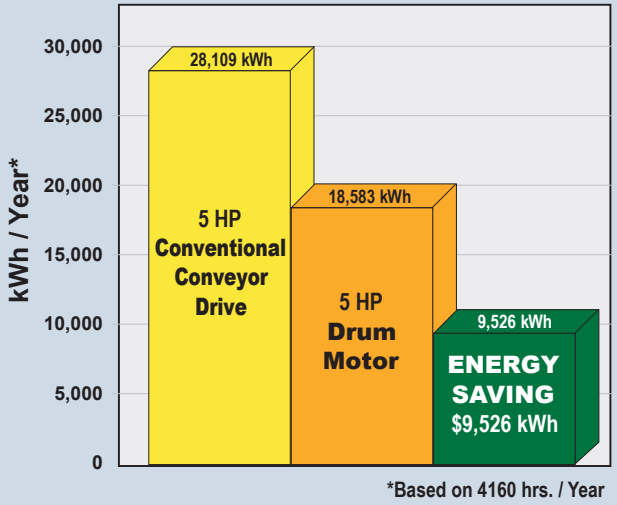
TOTAL EFFICIENCY 83.5%

Diagram B: Conveyor Driven by a Conventional Conveyor Drive



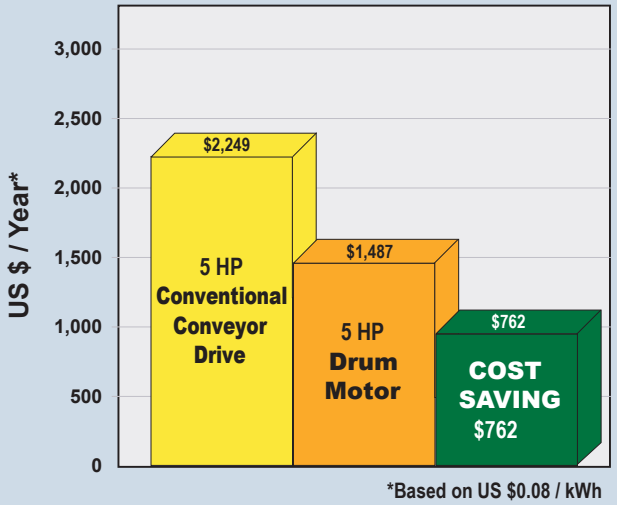
TOTAL EFFICIENCY 55.2%

Graph 1: Energy Consumption Comparison



*Based on 4160 hrs. / Year

Graph 2: Energy Cost Comparison



*Based on US $0.08 / kWh

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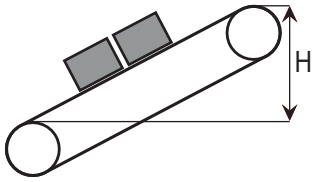
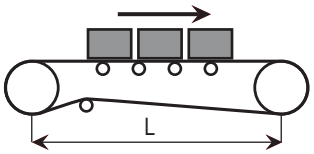
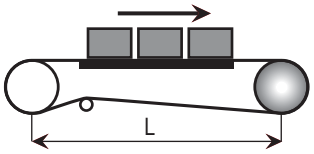
BELT PULL CALCULATION

Conveying System	F_0	F_1	F_2
	 Force without load	 Force to convey materials horizontally	 Force to convey materials on incline
R  Roller bed conveyor	$F_0 = 0.04\ (2P + Q)\ L$	$F_1 = 0.04 \times R \times L$	$F_2 = R \times H$
R  Slider bed conveyor	$F_0 = 1.1 \times P \times L \times C$	$F_1 = 1.1 \times R \times L \times C$	$F_2 = R \times H$

BELT PULL(BP):

$BP = (F_0 + F_1 + F_2)$ in pounds

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)

CALCULATIONS:

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NOTES

Van der Graaf DRUM MOTORS

NOTES

Van der Graaf DRUM MOTORS

NOTES

Van der Graaf DRUM MOTORS

Canada

USA

Netherlands

Van der Graaf has provided solutions to the material handling industry for over half a century. By making consistent investments in factory automation over the years, Van der Graaf continues as the leading global supplier of conveyor belt drives for a broad range of industries. Whether it's an explosion-proof motor for driving coal mine conveyor belts or sanitary drives in a food processing plant, Van der Graaf has innovative designs to solve application challenges.

Van der Graaf has adhered to a simple principle: design a superior product to meet customer needs in a changing marketplace.

Van der Graaf offers outstanding application engineering and customer service for high quality products and years of low maintenance performance. Our products and people are trusted around the world for reliable performance and personal service.

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