

Drum motor - MTD139 Class

MTD139 Synchronous Drum Motor is space-saving, all-in-one components with a motor and transmission system that is maintenance-free and fully protected within the drum.

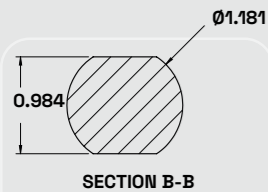
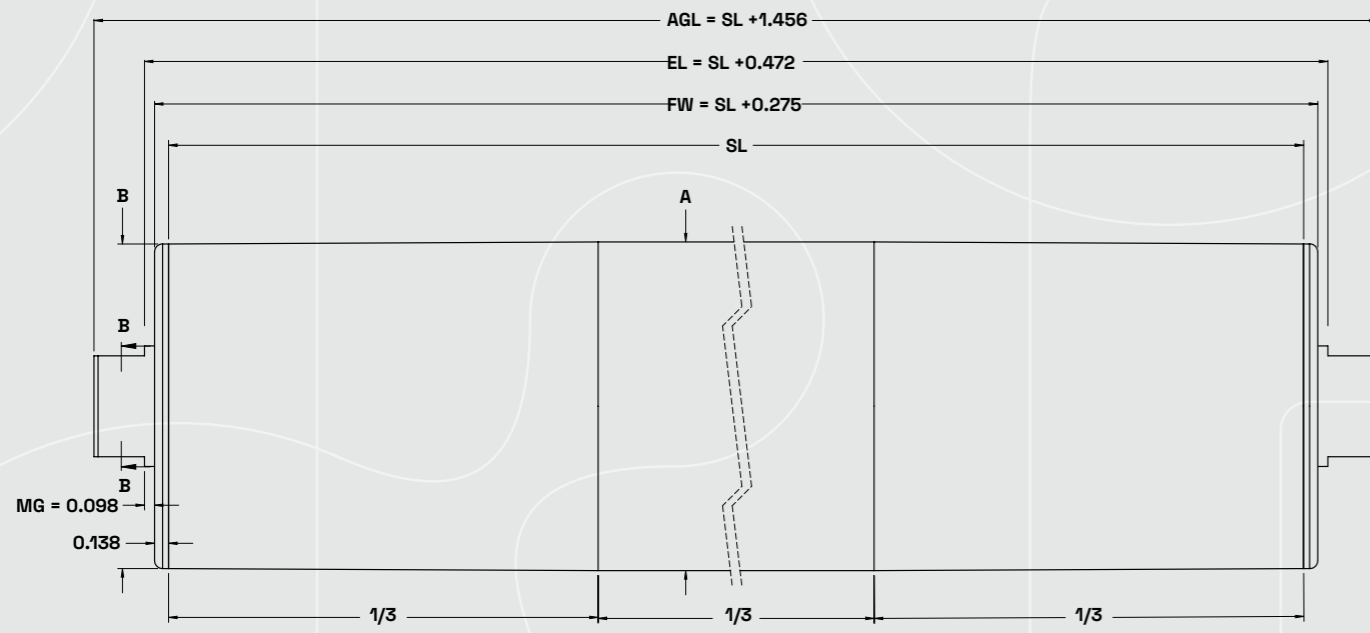
Our drum motors are completely oil-free. Oil contamination of conveyed goods is therefore impossible – a perfect match for food production industries.

Synchronous drum motors offer the highest electrical efficiencies currently available and are extremely economical.

Our synchronous motors have a higher efficiency and up to 9 times lower power than asynchronous drum motors due to minimized losses!

This increases reliability, reduces operating costs and simplifies integration!

- Lower energy consumption
- Oil free - minimize the risk of oil leaks
- Higher motor efficiency
- Enhanced food safety



Explanations:

- AGL = Total length of shaft
- SL = Shell length (Reference length / ordering length)
- EL = Installation length, inside diameter between side profiles
- FW = Face width
- MG = Length between drum motor and key

Type	ØA [in]	ØB [in]	Shell length max. [in]
Crowned	5.43	5.35	59.06
Cylindrical	5.35	5.35	59.06
Cylindrical with key	5.39	5.39	33.46
Any other dimension and any other shell profile on request			

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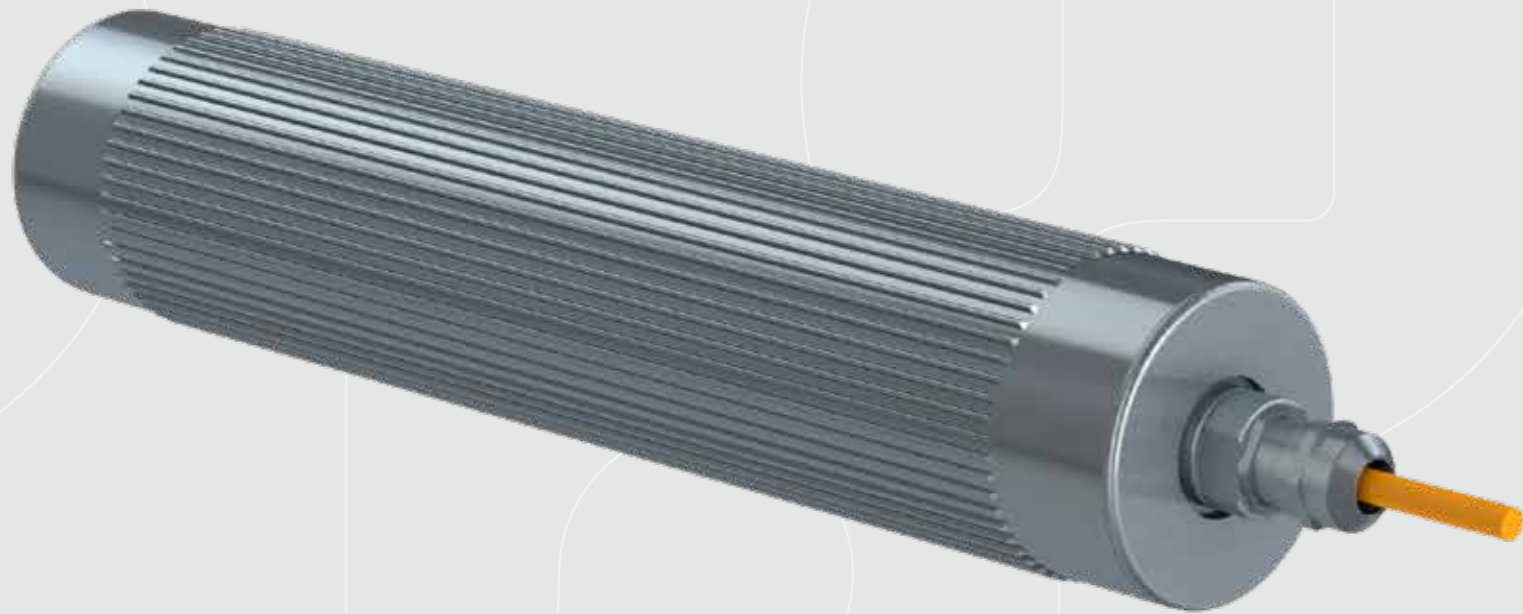
Motor Variants MTD139-1.5

Rated Values refer to the drum shell							
Power [HP]	Gear ratio [i]	Rotational Speed [RPM]	Linear Speed [Ft/min.]	Linear Speed [Ft/s]	Torque [Ft/lbf]	Belt pull [Lbf]	Min. Shell Length [in]
2	32	94	134	2.2	106	468	16.14
2	40	75	107	1.8	133	586	16.14

Custom gear combinations on requests.

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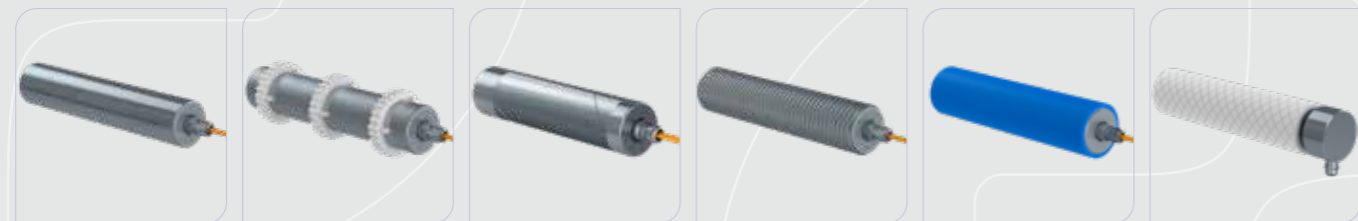


Available with the following Drum motor shells

We can supply all drum shell profiles also with sprockets as well as rubber sleeves.

- Cylindrical, crowned or conical shells
- Flat, crowned, conical or profiled rubber lining
- Radial grooves for round belts
- Milled guiding grooves and profiles

Many other designs are available. see some examples below.



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Possible speed adjustment ranges:

Sensorless operation with suitable frequency inverter	1 : 7 to 1 : 300 - (depending on inverter type)
Servo drive and feedback	up to 1 : 10.000

Options lead to an increase in the minimum shell length:

Option	SL _{min} (with option)
Resolver	Minimum shell length SL _{min} + 1.97 inches
SKS36	Minimum shell length SL _{min} + 2.756 inches
SKS36 with hybrid-cable	Minimum shell length SL _{min} + 4.724 inches

Motor data:

Rated power	HP	2.0	2.0
Rated speed	rpm	3.000	3.000
Rated frequency	Hz	150	150
Number of pole pairs		3	3
Wiring		Y	Y
Insulation class		F	F
Supply voltage range	1 x / 3 x VAC	200 .. 240	380 .. 480
DC Bus voltage range	VDC	280 .. 340	540 .. 680
Rated voltage	3 x VAC	171	318
Rated torque	Ft/lbf	3.53	3.53
Rated current per phase	A	6.1	3.3
Stall torque	Ft/lbf	3.69	3.69
Stall current per phase	A	6.2	3.3
Peak torque	Ft/lbf	8.81	8.81
Peak current	A	15.5	8.3
Voltage constant	1.000 V / min ⁻¹	51.2	100.5
Torque constant	Ft/lbf / A _{rms}	0.58	1.07
Winding resistance (2 phases)	Ω	1.9	7.1
Winding inductance (2 phases) identical to Ld and Lq	mH	12.5	43.0
Electrical time constant	ms	6.5	6.0
Moment of inertia rotor	Lb in ²	0.591	0.591
Anti condensing heating voltage	VDC	18	36

Certifications:

UL-certified: No
 Protection Class: IP66 / IP69K
 Efficiency Class: IE4

Cable specifications

Cable specifications

Power cable < 16.4 ft	
Construction	4 x AWG21 + (2 x AWG 24)C shielded
Voltage	600 V (AWG21)
Sheath material	PUR (TPE-U)
Outer diameter	0.3 in (max. 0.31 in)
Sheath colour	orange (similar to RAL 2003)
Temperature range (fixed in place)	- 58°F to + 221°F
Minimum bending radius (fixed in place)	7.5 x D
Flame retardant	Yes
Halogen free	Yes
Oil resistant	Yes
UL	AWM STYLE 21928 / 11559 221°F 600 V

Power cable ≥ 16.4 ft	
Construction	4 x AWG19 + (2 x AWG22)C shielded
Voltage	600V(AWG19)
Sheath material	PUR (TPE-U)
Outer diameter	0.3 in (max. 0.31 in)
Sheath colour	orange (similar to RAL 2003)
Temperature range (fixed in place)	-58°F to + 221°F
Minimum bending radius (fixed in place)	7.5 x D
Flame retardant	Yes
Halogen free	Yes
Oil resistant	Yes
UL	AWM STYLE 21928 / 11559 221 °F 600 V

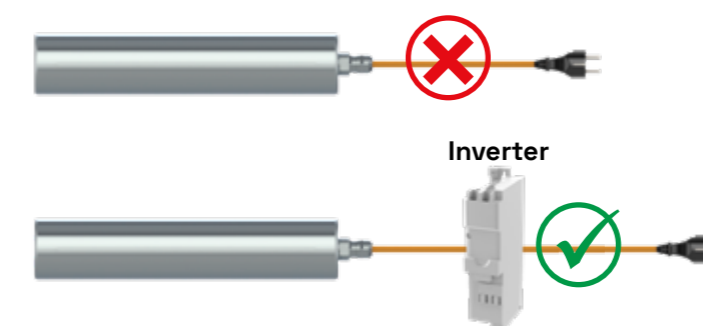
Colour assignment power	Signal / Function
Black / 1	U
Black / 2	V
Black / 3	W
Green-yellow	PE
Brown	KTY (+) or PTC
White	KTY (-) or PTC

Pin assignment Power / Option: Terminal Box	Signal / Function
L1	U
L2	V
L3	W
M5x8 Screw	PE
KTY+ / 5	KTY (+) or PTC
KTY- / 6	KTY (-) or PTC

Option Feedbacksystem

Characteristics - Inverter

MTS drum motors have an inverter between the electrical socket and the drum motor in order to avoid overload of the electrical circuits in the initial starting phase. The MTS drum motors runs at 150 Hz as standard, the frequency inverter enables the motor to run at various speeds.



Option: Motor feedback

MTS drum motors can be supplied with either resolver or encoder type SKS36, ECI 1119 or type EDS35:

Resolver

Resolver	
Number of poles	2
Input frequency	10 kHz
Input voltage	7 V _{rms}
Connection	Signal cable 6 AWG26, shielded

Cable specifications / Resolver cable	
Construction	3 x 2 x AWG26 shielded
Sheath material	PVC
Outer diameter	0,22 in
Sheath colour	Grey (RAL 7032)
Temperature range (fixed in place)	- 40 °F to + 176 °F
Minimum bending radius (fixed in place)	6 x D
Flame retardant	Yes
Halogen free	Yes
Oil resistant	Yes
UL	No

Colour assignment resolver cable	Signal / Function
White	REF +
Brown	REF -
Green	SIN +
Yellow	SIN -
Pink	COS +
Grey	COS -

Option Feedbacksystem

SKS36

SKS36	
Number of Sin / Cos Periods per revolution	128
Number of absolute revolutions	1 (single turn)
Resolution	4096
Communication interface	HIPERFACE
Supply voltage	7 to 12 V DC
Connection	2-Cable solution, Hybrid cable

Note: Motor data plate storage on SKS36 for PACDrive 3. Empty storage on request.

Cable specifications / SKS36 cable / 2-Cable solution	
Construction	4 x 2 x AWG26 shielded
Sheath material	PUR (TPE-U)
Outer diameter	0.21 in
Sheath colour	Black
Temperature range (fixed in place)	- 22 °F to + 194 °F
Minimum bending radius (fixed in place)	5 x D

Colour assignment SKS36	Signal / Function
Grey	DATA +
Green	DATA -
White	SIN +
Brown	REF SIN
Pink	COS +
Black	REF COS
Red	US (8 V DC)
Blue	GND (0 V DC)

Cable specifications / SKS36 cable / Hybrid cable	
Construction	Power (4 x AWG21) + Signal (2 x AWG21+3x(2x)AWG26 + 2 x AWG22)
Voltage	1000V peak
Sheath material	PUR
Outer diameter	0.44 in
Sheath colour	grey (similar to RAL 7001)
Temperature range (fixed in place)	- 13°F to + 176°F
Minimum bending radius (fixed in place)	5 x D
Flame retardant	Yes
Halogen free	Yes
Oil resistant	Yes
UL	AWM STYLE 20910 (176°F)

Option Feedbacksystem

Colour assignment / SKS36 / Hybrid cable	Signal / Function
Black / 1	U
Black / 2	V
Black / 3	W
green-yellow	PE
Black / 7	KTY (+) or PTC
Black / 8	KTY (-) or PTC
Yellow	DATA +
Green	DATA -
White	SIN +
Brown	REF SIN
Pink	COS +
Grey	REF COS
Red	US (8 V DC)
Blue	GND (0 V DC)

EDS35

EDS35	
Resolution per turn	24 bit
Number of absolute detectable turns	1
Measuring step per turn	16,277,216
Communication interface	HIPERFACE DSL
Connection	Hybrid cable, Terminal Box

Cable specifications / EDS35 / Hybrid cable	
Construction	((2xAWG26)C + 4 x AWG17)C
Voltage	1000V
Sheath material	PUR
Outer diameter	0.35 in (max. 0.37 in)
Sheath colour	orange
Temperature range (fixed in place)	- 58°F to + 221°F
Minimum bending radius (fixed in place)	7.5 x D
Flame retardant	Yes
Halogen free	Yes
Oil resistant	Yes
UL	AWM Style 21223 176°F 1000V

Colour assignment / Cable specifications / EDS35 / Hybrid cable	Signal / Function
Black / 1	U
Black / 2	V
Black / 3	W
Green-yellow	PE
blue	GND / DSL
white	+US / DSL+

Option Feedbacksystem

ECI1119

ECI1119	
Resolution per turn	19 bit
Number of absolute detectable turns	1
Measuring step per turn	544,288
Communication interface	EnDat 2.2
Connection	Hybrid cable

Cable specifications / ECI1119 / Hybrid cable	
Construction	Power (4 x AWG21) + Signal (2 x AWG21+3x(2x)AWG26 + 2 x AWG22)
Voltage	1000V peak
Sheath material	PUR
Outer diameter	0.44 in
Sheath colour	grey (similar to RAL 7001)
Temperature range (fixed in place)	- 13°F to + 176°F
Minimum bending radius (fixed in place)	5 x D
Flame retardant	Yes
Halogen free	Yes
Oil resistant	Yes
UL	AWM STYLE 20910 (176°F)

Colour assignment / ECI1119 / Hybrid cable	Signal / Function
Black / 1	U
Black / 2	V
Black / 3	W
Green-yellow	PE
brown Sensor	UP
white Sensor	0 V
grey	DATA
pink	DATA
green	CLOCK
yellow	CLOCK



Other feedback systems on request e.g. EnDat 2.2 or incremental encoder.

Thermal protection and material variants

Thermal protection

The MTS drum-motor is fitted, as standard, with a KTY84-130 thermal sensor. If necessary, we can also offer a PTC thermal sensor. The temperature sensor must be monitored by an external circuit, such as a frequency convertor which switches off the power supply to the motor, if the maximum temperature is exceeded.

KTY84-130, technical data	
Measurement range	- 40 °F to + 572 °F
Reference resistance	1,000 Ohm
Reference temperature	212 °F
Tolerance	+/- 3 %
Measurement current	2 mA

Optionally it is possible to fit a PTC sensor.
Not every Inverter type can monitor KTY thermal protection, most of Inverters types operate with PTC.

PTC, technical Data	
Operating voltage range	2,5 to 24 V DC
Maximum permissible operating voltage	30 V DC

Resistance at switching temperature	
- 4 °F to T _{REF} - 20 K	< 250 Ω
T _{REF} - 5 K	≤ 550 Ω
T _{REF} + 5 K	≥ 1,330 Ω
T _{REF} + 15 K	≥ 4,000 Ω

Constructions / Material variants

Component	Variants	Standard	Option
Shell	Crowned	Steel 1.0038	Stainless steel 1.4301
	Cylindrical	Steel 1.0038	Stainless steel 1.4301
	Cylindrical with key	Steel 1.0038	Stainless steel 1.4301
[Other materials on request]	Variants: Any profiled drum shell design, knurling (length depending)		
	Flat rubber lagging	NBR, shore 50 - 90. Colour: blue or white	
	Profiled rubber lagging	NBR, shore 50 - 90. Colour: blue or white	
Shaft	D = 30 / SW = 25 / SFL = 12,5	Stainless steel 1.4305	
	Alternative design on request	Stainless steel 1.4305	
Cover	Laser engreaved name plate	Stainless steel 1.4305	
Labyrinth seal		Galvanised steel	Stainless steel 1.4301
			Stainless steel 1.4305
Electrical connection	Straight cable gland	Brass	Stainless steel 1.4305
	Elbow cable gland	Stainless steel 1.4305	
	Terminal box	Stainless steel 1.4305	
	Cable with connection plugs on request		

Tested frequency converters / servo drives

MTS drum motors have been tested with the following frequency converters and servo drives.

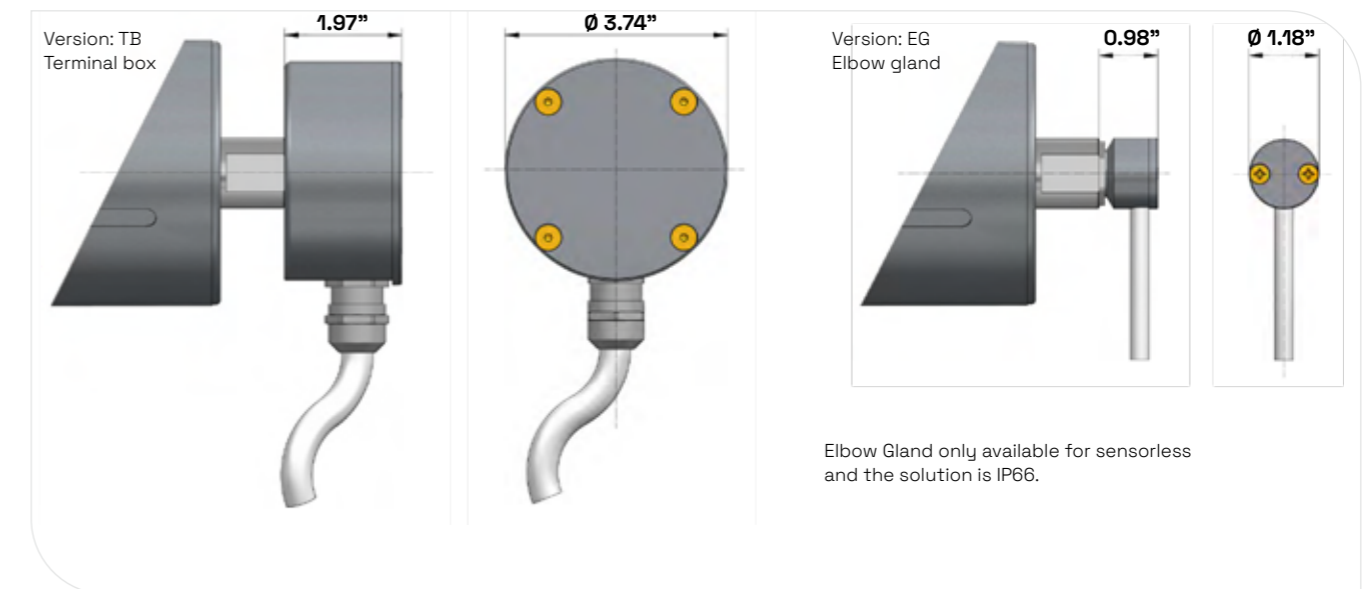
Manufacturer	Driver / VFD closed loop		VFD / sensorless
	Type	Geber / Sensor	Type
ABB			ACSM1
Rockwell / Allen Bradley	Kinetix 5700	Encoder Resolver with converter	AB Powerflex 525
Beckhoff	AX5000	Resolver, SKS36	AX5000
	AX8000	EDS35	AX8000
Bonfiglioli			AGILE
B&R			ACOPOS Sinverter P74
Danfoss	VLT FC 302	Resolver	VLT FC 2800 VLT FC 302
Emerson	Unidrive M700	Encoder	Unidrive M600
Festo			CMMT-AS
Hitachi			WJ200
Invertek			Optidrive E3 Optidrive P2
	Combivert F5	Resolver	Combivert F5 SCL
KEB	Combivert S6	Resolver / Encoder	Combivert G6 Combivert S6
	i950 series	Resolver	i500 series
Lenze		Encoder	8400 State Line
		Encoder	8400 Motec
	8400 Top Line	Resolver	
Nord			SK 215E SK 500 P
	Omron		MX2 V1000
Schneider Electric	ATV 340	Resolver	ATV 320
	LXM 32 / 52 / 62	SKS 36	ATV 340
	ILD	SKS 36	LXM 62+
SEW	Movidrive B	Resolver, SKS36	Movitrac LTP-B Movitrac LTE-B*
Siemens	Sinamics 120	Resolver	Sinamics G120
Yaskawa			A1000

* Only for continuous motion

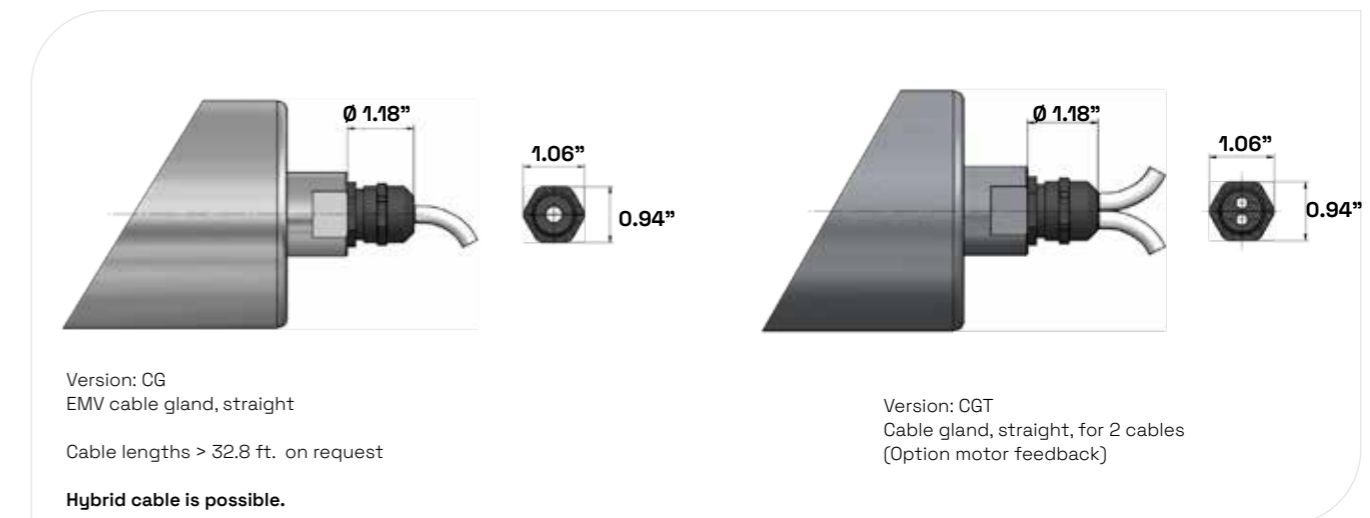
Technical data

Cable connection, dimensions cable connection and constructions/material variants are the same for all drum motor classes.

Cable Connection



Dimensions Cable Connection



Operating temperature range of our drum motor

Standard when operating with belt	+41 °F to +104 °F
Optional low temperature range	to -13 °F lower temperature on request
Optional high temperature range	to +158 °F