

Drum motor - MTS113 Class

MTS113 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.

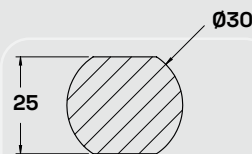
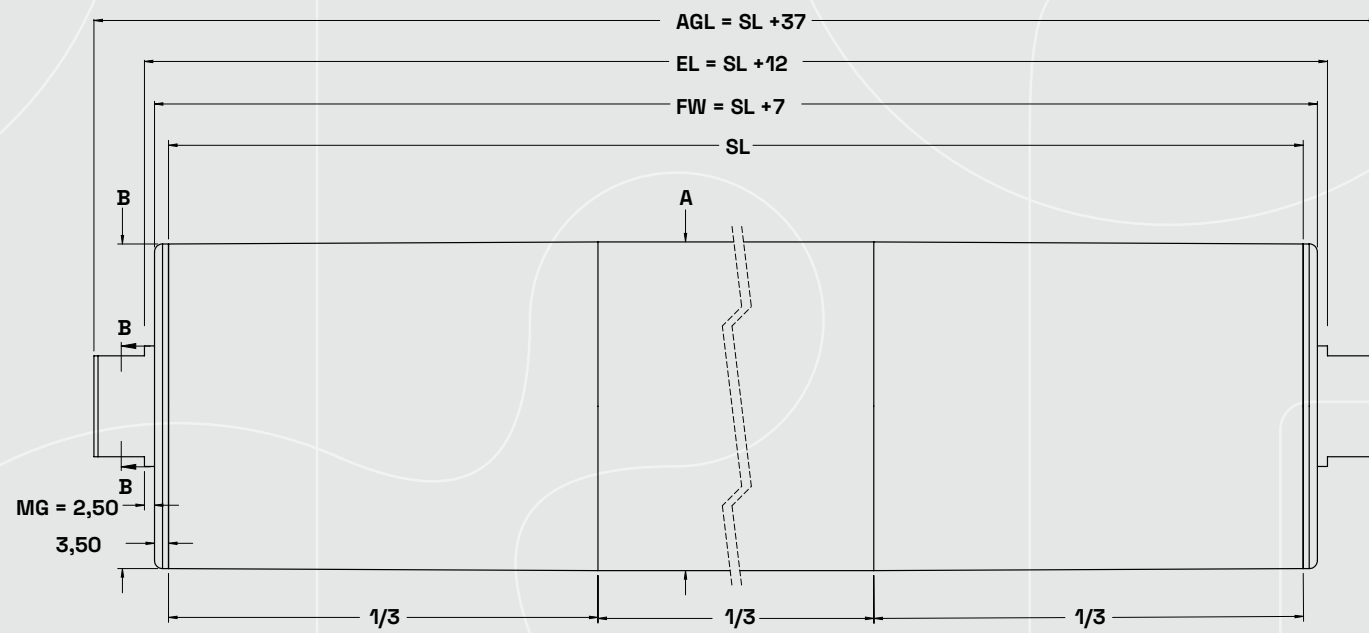
Our drum motors are completely oil-free. Oil contamination of conveyed goods is therefore impossible – a perfect match for food production industries.

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

NGI 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 [mm] | ØB [mm] | Shell length max. [mm] |
|--|------------|------------|---------------------------|
| Crowned | 113,5 | 112 | 1300 |
| Cylindrical | 112 | 112 | 1300 |
| Cylindrical with key | 113 | 113 | 850 |
| Any other dimensions and any other shell profiles on request | | | |

Drum motor - MTS113 Class

Motor Variants MTS113-0,19

| Rated Values refer to the drum shell | | | | | | | |
|--------------------------------------|------------|------------------|--------------|--------------|--------|-----------|-------------------|
| Power | Gear ratio | Rotational Speed | Linear Speed | Linear Speed | Torque | Belt pull | Min. Shell Length |
| [kW] | [i] | [RPM] | [m/min.] | [m/s] | [Nm] | [N] | [mm] |
| 0,19 | 8 | 375 | 133 | 2,22 | 4,6 | 82 | 260 |
| 0,19 | 12 | 250 | 89 | 1,48 | 6,8 | 120 | 270 |
| 0,19 | 16 | 188 | 67 | 1,11 | 9,0 | 160 | 270 |
| 0,19 | 20 | 150 | 53 | 0,89 | 11,3 | 200 | 270 |
| 0,19 | 25 | 120 | 43 | 0,71 | 14 | 250 | 270 |
| 0,19 | 32 | 94 | 33 | 0,56 | 18 | 319 | 270 |
| 0,19 | 40 | 75 | 27 | 0,44 | 23 | 399 | 270 |
| 0,19 | 160 | 19 | 7 | 0,11 | 44 | 786 | 290 |

Custom gear combinations on requests.

Motor Variants MTS113-0,38

| Rated Values refer to the drum shell | | | | | | | |
|--------------------------------------|------------|------------------|--------------|--------------|--------|-----------|-------------------|
| Power | Gear ratio | Rotational Speed | Linear Speed | Linear Speed | Torque | Belt pull | Min. Shell Length |
| [kW] | [i] | [RPM] | [m/min.] | [m/s] | [Nm] | [N] | [mm] |
| 0,38 | 8 | 375 | 133 | 2,22 | 9,2 | 163 | 290 |
| 0,38 | 12 | 250 | 89 | 1,48 | 13,5 | 240 | 300 |
| 0,38 | 16 | 188 | 67 | 1,11 | 18 | 319 | 300 |
| 0,38 | 20 | 150 | 53 | 0,89 | 22,6 | 399 | 300 |
| 0,38 | 25 | 120 | 43 | 0,71 | 28 | 499 | 300 |
| 0,38 | 32 | 94 | 33 | 0,56 | 36,1 | 639 | 300 |
| 0,38 | 40 | 75 | 27 | 0,44 | 40 | 708 | 300 |
| 0,38 | 160 | 19 | 7 | 0,11 | 44 | 786 | 320 |

Custom gear combinations on requests.

Motor Variants MTS113-0,72

| Rated Values refer to the drum shell | | | | | | | |
|--------------------------------------|------------|------------------|--------------|--------------|--------|-----------|-------------------|
| Power | Gear ratio | Rotational Speed | Linear Speed | Linear Speed | Torque | Belt pull | Min. Shell Length |
| [kW] | [i] | [RPM] | [m/min.] | [m/s] | [Nm] | [N] | [mm] |
| 0,72 | 8 | 375 | 133 | 2,22 | 17,7 | 313 | 300 |
| 0,72 | 12 | 250 | 89 | 1,48 | 25,9 | 459 | 310 |
| 0,72 | 16 | 188 | 67 | 1,11 | 34,6 | 612 | 310 |
| 0,72 | 20 | 150 | 53 | 0,89 | 43,2 | 765 | 310 |
| 0,72 | 25 | 120 | 42 | 0,70 | 40 | 714 | 310 |
| 0,72 | 32 | 94 | 33 | 0,56 | 44,0 | 779 | 310 |

Custom gear combinations on requests.

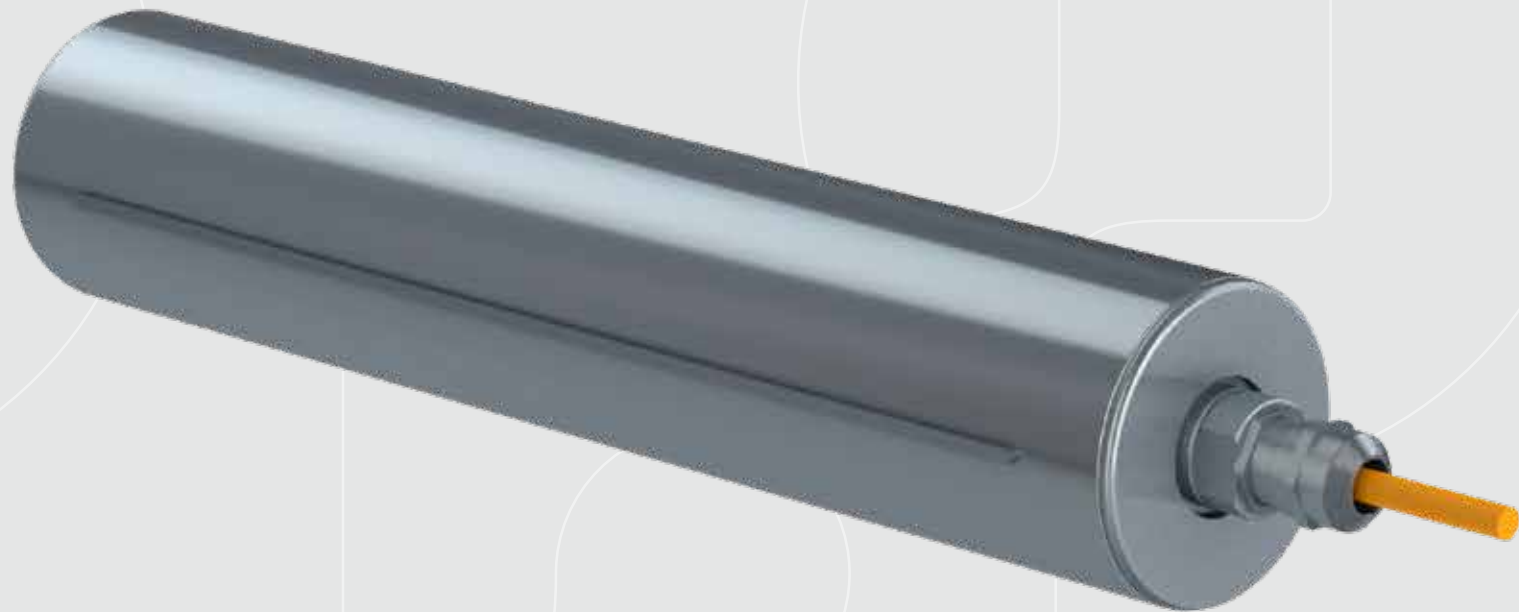
Motor Variants MTS113-1,01

| Rated Values refer to the drum shell | | | | | | | |
|--------------------------------------|------------|------------------|--------------|--------------|--------|-----------|-------------------|
| Power | Gear ratio | Rotational Speed | Linear Speed | Linear Speed | Torque | Belt pull | Min. Shell Length |
| [kW] | [i] | [RPM] | [m/min.] | [m/s] | [Nm] | [N] | [mm] |
| 1,01 | 8 | 375 | 133 | 2,22 | 18,0 | 319 | 320 |
| 1,01 | 12 | 250 | 89 | 1,48 | 36,1 | 639 | 330 |
| 1,01 | 16 | 188 | 67 | 1,11 | 44,0 | 779 | 330 |
| 1,01 | 20 | 150 | 53 | 0,89 | 44,0 | 779 | 330 |
| 1,01 | 25 | 120 | 42 | 0,70 | 40 | 714 | 330 |
| 1,01 | 32 | 94 | 33 | 0,56 | 44,0 | 779 | 330 |

Custom gear combinations on requests.

Drum motor - MTS113 Class

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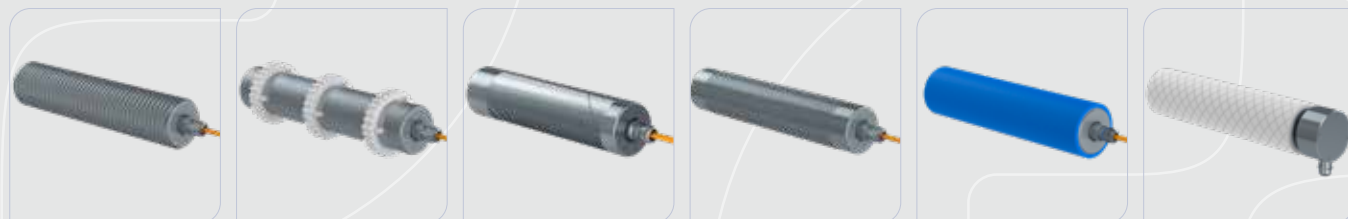


Available with the following Drum motor shells

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.



Drum motor - MTS113 Class

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} + 50 mm |
| SKS36 | Minimum shell length SL _{min} + 70 mm |
| SKS36 with hybrid cable | Minimum shell length SL _{min} + 120 mm |

Motor data:

| Rated power | kW | 0,19 | 0,38 | 0,72 | 0,72 | 1,01 | 1,01 |
|--|-----------------------------|------------|------------|------------|------------|------------|------------|
| Rated speed | rpm | 3.000 | 3.000 | 3.000 | 3.000 | 3.000 | 3.000 |
| Rated frequency | Hz | 150 | 150 | 150 | 150 | 150 | 150 |
| Number of pole pairs | | 3 | 3 | 3 | 3 | 3 | 3 |
| Wiring | | Y | Y | Y | Y | Y | Y |
| Insulation class | | F | F | F | F | F | F |
| Supply voltage range | 1 x / 3 x VAC | 200 .. 480 | 200 .. 480 | 200 .. 240 | 380 .. 480 | 200 .. 240 | 380 .. 480 |
| DC Bus voltage range | VDC | 280 .. 680 | 280 .. 680 | 280 .. 340 | 540 .. 680 | 280 .. 340 | 540 .. 680 |
| Rated voltage | 3 x VAC | 181 | 181 | 181 | 320 | 181 | 320 |
| Rated torque | Nm | 0,6 | 1,2 | 2,3 | 2,3 | 3,2 | 3,2 |
| Rated current per phase | A | 0,8 | 1,5 | 2,6 | 1,6 | 3,7 | 2,1 |
| Stall torque | Nm | 0,7 | 1,5 | 2,8 | 2,8 | 3,5 | 3,5 |
| Stall current per phase | A | 0,9 | 1,8 | 3,1 | 1,8 | 3,9 | 2,2 |
| Peak torque | Nm | 2,8 | 6,0 | 11,2 | 11,2 | 14,0 | 14,0 |
| Peak current | A | 3,6 | 7,2 | 12,4 | 7,2 | 15,6 | 8,8 |
| Voltage constant | 1.000 V / min ⁻¹ | 49,6 | 51,7 | 54,3 | 95,3 | 55,0 | 97,5 |
| Torque constant | Nm / A _{rms} | 0,75 | 0,80 | 0,88 | 1,44 | 0,86 | 1,52 |
| Winding resistance (2 phases) | Ω | 26,4 | 9,8 | 4,6 | 14,2 | 2,8 | 9,0 |
| Winding inductance (2 phases) identical to Ld and Lq | mH | 37,6 | 18,6 | 11,8 | 36,2 | 8,4 | 26,0 |
| Electrical time constant | ms | 1,4 | 1,9 | 2,6 | 2,5 | 3,0 | 2,9 |
| Moment of inertia rotor | kg cm ² | 0,22 | 0,41 | 1,40 | 1,40 | 1,93 | 1,93 |
| Anti condensing heating voltage | VDC | 35 | 26 | 23 | 40 | 19 | 34 |

Certifications:

UL-certified: Yes / Optional
 Protection Class: IP66 / IP69K
 Efficiency Class: IE4

Cable specifications

Cable specifications

| Power cable < 5m | |
|---|--|
| Construction | 4 x 0,50 mm ² + (2 x 0,25 mm ²)C shielded |
| Voltage | 600 V (0,5 mm ²) |
| Sheath material | PUR (TPE-U) |
| Outer diameter | 7,6 mm (max. 7,9 mm) |
| Sheath colour | orange (similar to RAL 2003) |
| Temperature range (fixed in place) | - 50°C to + 105°C |
| Minimum bending radius (fixed in place) | 7,5 x D |
| Flame retardant | Yes |
| Halogen free | Yes |
| Oil resistant | Yes |
| UL | AWM STYLE 21928 / 11559 105°C 600 V |

| Power cable ≥ 5m | |
|---|--|
| Construction | 4 x 0,75 mm ² + (2 x 0,34 mm ²)C shielded |
| Voltage | 600 V (0,5 mm ²) |
| Sheath material | PUR (TPE-U) |
| Outer diameter | 7,6 mm (max. 7,9 mm) |
| Sheath colour | orange (similar to RAL 2003) |
| Temperature range (fixed in place) | - 50°C to + 105°C |
| Minimum bending radius (fixed in place) | 7,5 x D |
| Flame retardant | Yes |
| Halogen free | Yes |
| Oil resistant | Yes |
| UL | AWM STYLE 21928 / 11559 105°C 600 V |

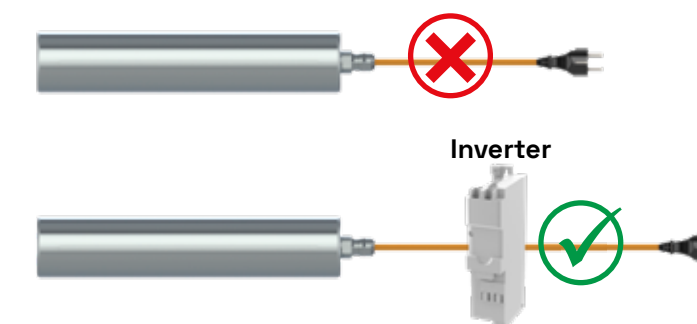
| Colour assignment power | Signal / Function |
|-------------------------|-------------------|
| Black / 1 | U |
| Black / 2 | V |
| Black / 3 | W |
| Green-yellow | PE |
| Brown | KTY (+) or PTC |
| White | KTY (-) or PTC |

| 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 x 0,14 qmm, shielded |

| Cable specifications / Resolver cable | |
|---|---------------------------------------|
| Construction | 3 x 2 x 0,14 mm ² shielded |
| Sheath material | PVC |
| Outer diameter | 5,8 mm |
| Sheath colour | Grey (RAL 7032) |
| Temperature range (fixed in place) | - 40 °C to + 80 °C |
| 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 0,15 mm ² shielded |
| Sheath material | PUR (TPE-U) |
| Outer diameter | 5,3 mm |
| Sheath colour | Black |
| Temperature range (fixed in place) | - 30 °C to + 90 °C |
| 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 4x0,5 + 2x0,5 Signal 3x(2x)0,14+2x0,34 |
| Voltage | 1000V peak |
| Sheath material | PUR |
| Outer diameter | 11,1mm |
| Sheath colour | grey (similar to RAL 7001) |
| Temperature range (fixed in place) | - 25°C to + 80°C |
| Minimum bending radius (fixed in place) | 5 x D |
| Flame retardant | Yes |
| Halogen free | Yes |
| Oil resistant | Yes |
| UL | AWM STYLE 20910 (80°C) |

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 | 16.777.216 |
| Communication interface | HIPERFACE DSL |
| Connection | Hybrid cable, Terminal Box |

| Cable specifications / EDS35 / Hybrid cable | |
|---|---|
| Construction | RCB-4x1,0+(2x0,126mm ²)-PUR-9-S-000 |
| Voltage | 1000V |
| Sheath material | PUR |
| Outer diameter | 9mm +-0,3 |
| Sheath colour | orange |
| Temperature range (fixed in place) | - 50°C to + 105°C |
| Minimum bending radius (fixed in place) | 7,5 x D |
| Flame retardant | Yes |
| Halogen free | Yes |
| Oil resistant | Yes |
| UL | AWM Style 21223 80°C 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 | 524.288 |
| Communication interface | EnDat 2.2 |
| Connection | Hybrid cable |

| Cable specifications / ECI1119 / Hybrid cable | |
|---|--|
| Construction | Power 4x0,5 + 2x0,5 Signal 3x(2x)0,14+2x0,34 |
| Voltage | 1000V peak |
| Sheath material | PUR |
| Outer diameter | 11,1mm |
| Sheath colour | grey (similar to RAL 7001) |
| Temperature range (fixed in place) | - 25°C to + 80°C |
| Minimum bending radius (fixed in place) | 5 x D |
| Flame retardant | Yes |
| Halogen free | Yes |
| Oil resistant | Yes |
| UL | AWM STYLE 20910 (80°C) |

| 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 °C to + 300 °C |
| Reference resistance | 1.000 Ohm |
| Reference temperature | 100 °C |
| 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 | |
|-------------------------------------|---------------------|
| - 20 °C to $T_{REF} - 20 K$ | < 250 Ω |
| $T_{REF} - 5 K$ | $\leq 550 \Omega$ |
| $T_{REF} + 5 K$ | $\geq 1.330 \Omega$ |
| $T_{REF} + 15 K$ | $\geq 4.000 \Omega$ |

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 | | |