renova

WE NEVER LOSE CONTROL

# powderex

## POWDER BRAKES AND CLUTCHES


# powderex

## Powder brakes and clutches

Powderex brakes for unwinders and clutches for rewinders particularly stand out for their:

- Compact size
- Very high sensitivity
- Low residual torque
- Soundless operating
- No dust development
- Long service life

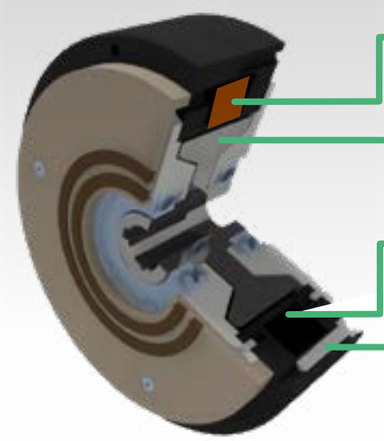
Wide range of sizes - in the standard version, equipped with radiator or with fan - are available to offer solutions to all drive problems requiring torque between 3 Nm and 170 Nm.

Send us your application requirements and we will work with you to find the model that suits your needs.

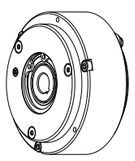
# POWDEREX MODELS

# OPERATING PRINCIPLE

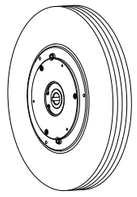
An electromagnetic coil generates a variable and controlled magnetic field which directly modifies the magnetic powder viscosity. The powder viscosity controls the torque transmission between the external and the internal rotors.
The device acts as a brake when the external rotor is fixed, otherwise it acts as a clutch.



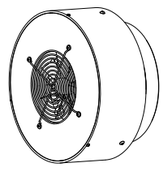

## BRAKES



B
standard

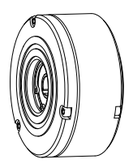


BR
with radiator

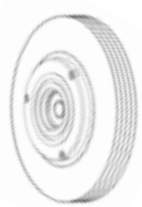


BV
with fan

## CLUTCHES



C
standard



CR
with radiator

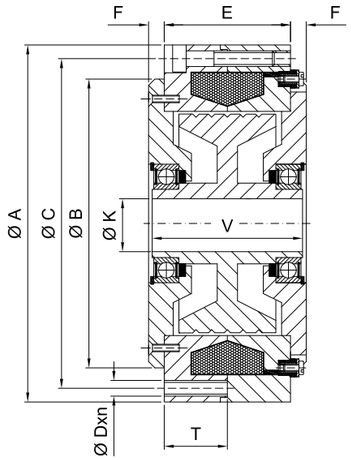


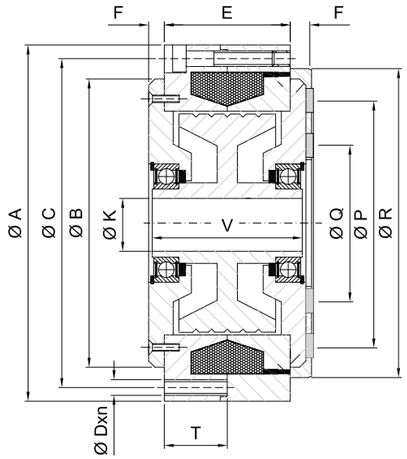
## TECHNICAL SPECIFICATIONS

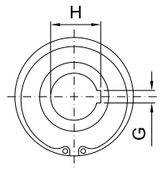
| | PWX 003 | PWX 006 | PWX 012 | PWX 035 | PWX 065 | PWX 080 | PWX 120 | PWX 170 |
|---|---|---|---|---|---|---|---|---|
| nominal torque | 3 Nm | 6 Nm | 12 Nm | 35 Nm | 65 Nm | 80 Nm | 120 Nm | 170 Nm |
| residual torque | 0,04 Nm | 0,06 Nm | 0,15 Nm | 0,25 Nm | 0,4 Nm | 0,4 Nm | 0,6 Nm | 1,5 Nm |
| supply voltage | 24 VDC | 24 VDC | 24 VDC | 24 VDC | 24 VDC | 24 VDC | 24 VDC | 24 VDC |
| current intensity | 0.8 A | 0.96 A | 0.92 A | 1 A | 1 A | 1,1 A | 1,2 A | 1,2 A |
| resistance | 30 Ohm | 25 Ohm | 26 Ohm | 24 Ohm | 24 Ohm | 22 Ohm | 21 Ohm | 21 Ohm |
| engaging time (t 9) | 100 m/s | 110 m/s | 130 m/s | 280 m/s | 360 m/s | 450 m/s | 530 m/s | 800 m/s |
| disengaging time (t 01) | 50 m/s | 60 m/s | 70 m/s | 100 m/s | 140 m/s | 170 m/s | 200 m/s | 270 m/s |
| brake | PWX 003 B | PWX 006 B | PWX 012 B | PWX 035 B | PWX 065 B | PWX 080 B | PWX 120 B | PWX 170 B |
| cont. heat dissipation | 50 W | 80 W | 100 W | 150 W | 200 W | 250 W | 400 W | 500 W |
| weight | 0,75 kg | 1,4 kg | 2,6 kg | 5,0 kg | 9,0 kg | 12,7 kg | 18 kg | 24 kg |
| brake with radiator | PWX 003 BR | PWX 006 BR | PWX 012 BR | PWX 035 BR | PWX 065 BR | PWX 080 BR | PWX 120 BR | PWX 170 BR |
| cont. heat dissipation | 100 W | 160 W | 200 W | 280 W | 400 W | 500 W | 800 W | 1000 W |
| weight | 1,1 kg | 1,9 kg | 3,8 kg | 7,5 kg | 13,0 kg | 18,5 kg | 23 kg | 30 kg |
| brake with fan* | PWX 003 BV | PWX 006 BV | PWX 012 BV | PWX 035 BV | PWX 065 BV | PWX 080 BV | PWX 120 BV | PWX 170 BV |
| cont. heat dissipation | 150 W | 300 W | 400 W | 600 W | 800 W | 1050 W | 1600 W | 2000 W |
| weight | 1,4 kg | 2,2 kg | 4,5 kg | 8,0 kg | 13,0 kg | 17,0 kg | 24 kg | 28 kg |
| clutch | PWX 003 C | PWX 006 C | PWX 012 C | PWX 035 C | PWX 065 C | PWX 080 C | PWX 120 C | PWX 170 C |
| cont. heat dissipation (500 rpm) | 80 W | 100 W | 120 W | 250 W | 280 W | 350 W | 800 W | 1000 W |
| cont. heat dissipation (1000 rpm) | 100 W | 120 W | 150 W | 250 W | 350 W | 550 W | 1000 W | 1250 W |
| weight | 0,8 kg | 1,5 kg | 2,8 kg | 5,2 kg | 9,4 kg | 13,3 kg | 18,9 kg | 24,8 kg |
| clutch with radiator | PWX 003 CR | PWX 006 CR | PWX 012 CR | PWX 035 CR | PWX 065 CR | PWX 080 CR | PWX 120 CR | PWX 170 CR |
| cont. heat dissipation (500 rpm) | 250 W | 350 W | 440 W | 640 W | 960 W | 1200 W | 1600 W | 2200 W |
| cont. heat dissipation (1000 rpm) | 300 W | 400 W | 500 W | 800 W | 1200 W | 1550 W | 2000 W | 2750 W |
| weight | 1,2 kg | 2,0 kg | 4,0 kg | 7,7 kg | 13,4 kg | 19,0 kg | 23,7 kg | 28,8 kg |

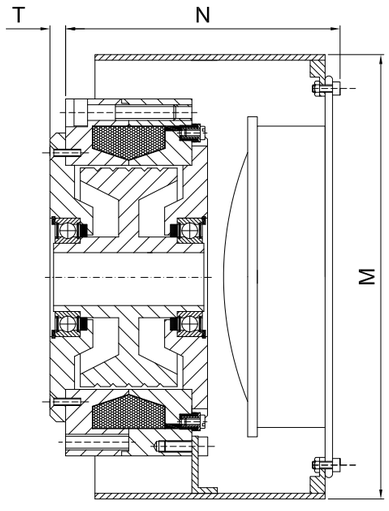
(* fan voltage: 24, 115 or 230 VAC)

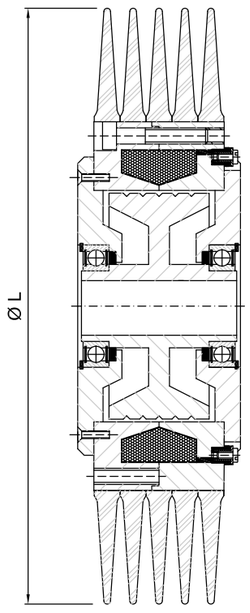
# DIMENSIONS



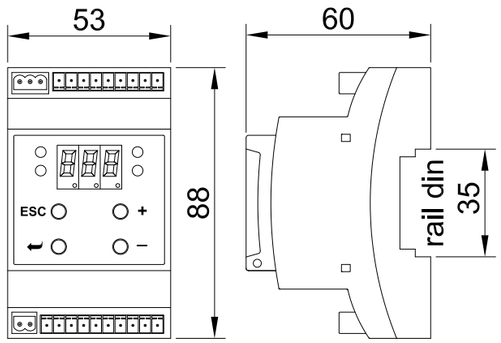

| dimension (mm) | PWX 003 | PWX 006 | PWX 012 | PWX 035 | PWX 065 | PWX 080 | PWX 120 | PWX 170 |
|---|---|---|---|---|---|---|---|---|
| A | 75 | 91 | 114 | 156 | 188 | 205 | 254 | 254 |
| B | 62 | 78 | 92 | 125 | 146 | 149 | 214 | 214 |
| C | 69 | 85 | 105 | 146 | 174 | 188 | 233 | 233 |
| D x n | M 3x3 | M 3x3 | M 5x3 | M 5x6 | M 6x6 | M 6x6 | Ø 8,5x8 | Ø 8,5x8 |
| E | 25 | 32 | 40 | 48 | 56 | 64 | 70 | 86 |
| F | 5,5 | 5,5 | 5 | 5 | 5 | 6 | 6 | 6 |
| G | 3P9 | 4P9 | 4P9 | 5P9 | 8P9 | 8P9 | 10P9 | 10P9 |
| H | $11^{+0,1}$ | $19,3^{+0,1}$ | $16^{+0,1}$ | $19,7^{+0,1}$ | $22,8^{+0,1}$ | $31,3^{+0,2}$ | $31,3^{+0,2}$ | $31,3^{+0,2}$ |
| K | 10 | 17 | 15 | 17 | 20 | 28 | 28 | 28 |
| K max | 15 | 22 | 25 | 35 | 38 | 38 | 42 | 42 |
| L (with radiator) | 110 | 140 | 200 | 260 | 330 | 350 | 390 | 390 |
| M (with fan) | 100 | 120 | 154 | 203 | 236 | 255 | 284 | 284 |
| N (with fan) | 86 | 93 | 99 | 125 | 137 | 145 | 202 | 218 |
| O (clutch) | 42 | 52 | 54 | 64 | 70 | 90 | 108 | 108 |
| P (clutch) | 60 | 70 | 74 | 84 | 90 | 110 | 132 | 132 |
| R (clutch) | 74,5 | 90,5 | 114 | 132 | 154 | 184 | 222 | 222 |
| S (clutch) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| T | 12,5 | 16 | 20 | 24 | 28 | 32 | 70 | 86 |
| P-O/2 (clutch) | 9 | 9 | 10 | 10 | 10 | 10 | 12 | 12 |
| V | 31 | 37 | 45 | 50 | 58 | 66 | 74 | 90 |

# SENSORS

# AL PWX 5A

## POWER SUPPLY MODULE

Power supply module with microprocessor and current-controlled output for a precise control of the braking torque, regardless of the temperature of the brake.
Analog inputs for torque reference signal and serial communication RS485 for the control and programming with Modbus protocol. Digital inputs and analogue outputs for a wide management of main functions.



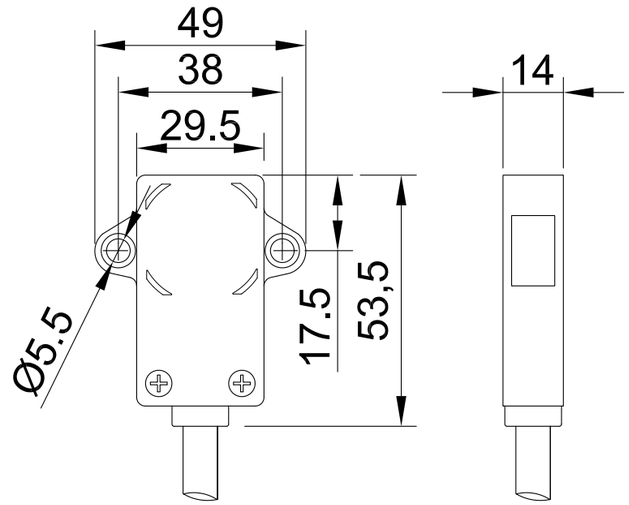

| | TECHNICAL DATA |
|---|---|
| power supply | 12÷27 V AC or 12÷36 V DC |
| set power output | Adjustable from 1A to 5A, current-stabilized output, regulated through the reference analog inputs. Reference nominal tension 24V DC |
| power output | 24 VDC 200 mA for sensors power supply (eg.: ultrasonic) |
| set point auxiliary output | 10 VDC 50 mA (control through potentiometer 5 khm) |
| digital inputs | 3 dedicated digital inputs with configurable activation level through JP2 (0V or 24VDC); FREE/BRAKE/DEMAG functions |
| digital outputs | 2 set-point analog inputs 0÷10 VDC and 4÷20 mA |
| analog outputs | 2 configurable analog outputs (supplied power or set point) |
| comm interface | RS485 |
| jumper | JP1: RS485 termination; JP2: set up digital input activation mode |
| LEDs | 2 for functioning and programming check; 2 for activated pre-programmed functions check |
| function | PSW protection - Automatic Demag function – Display value setting - Smart Dancer |
| operating temperature | +0°C / +70°C |
| available versions | DIP-SWITCHES user interface (mod. ALPWX-5A-DSW) |
| | LED DISPLAY user interface (mod. ALPWX-5A-LED) |



# SAX 360

## ANGULAR SENSOR

Non-contact inductive angular sensor with programmable angle of measurement.

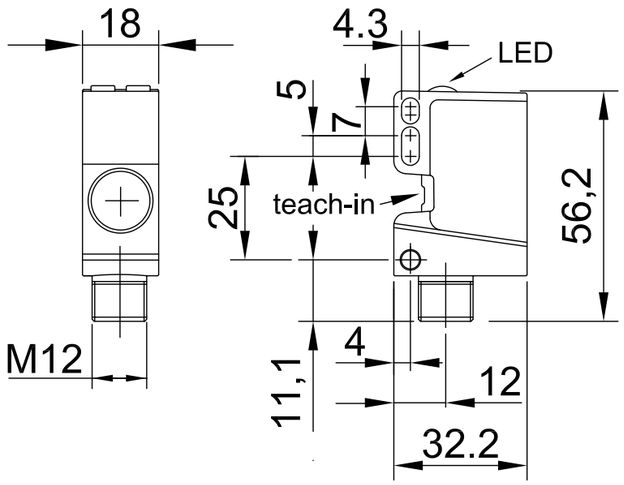



| | TECHNICAL DATA |
|---|---|
| power supply | 15÷30 Vdc; 100 mA |
| angle of measurement | 0÷360° programmable |
| resolution | 12 bit |
| repeatability | ≤ 0,025% full scale |
| operating temperature | from -25 °C to +70 °C |
| outputs | analog 0÷10 V or 4÷20 mA programmable |
| LEDs | LED for power supply + LED for measurement field |

# USX 5000

**ULTRASONIC SENSOR**

Ultrasonic sensor with programmable measurement field


| | TECHNICAL DATA |
|---|---|
| power supply | 12÷13 Vdc; 35 mA |
| angle of measurement | 70÷1000 mm programmable |
| resolution | < 0,3 mm |
| repeatability | < 0,5 mm |
| time of response | < 40 m/s |
| operating temperature | from -25 °C to +65 °C |
| output | analog 0÷10 V; 2 digital push pull |
| output current | < 100 mA |
| LEDs | LED for power supply + LED for measurement field |



# SENSOREX

**LOAD CELLS**

To be used in combination with rollers to precisely detect the tension of a web. A wide range of models are available, all tested, calibrated and provided with certificate.

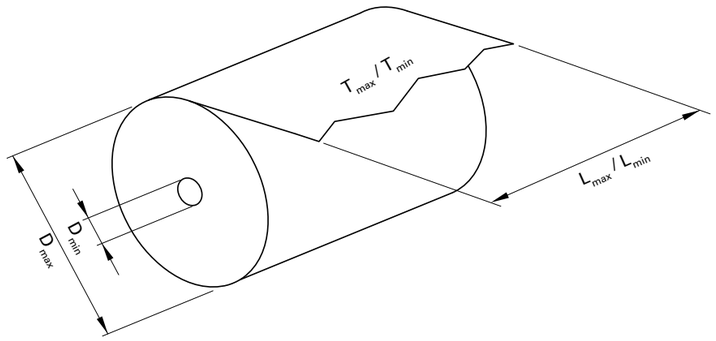
- Flange load cells
- Flange load cells with clearance hole
- Base style load cells
- Cantilever load cells

# BRAKE SELECTION GUIDE

| | unit of measurement |
|---|---|
| t | braking time [s] |
| v | web speed [m/min] |
| $T_{max/min}$ | max/min web tension [N] |
| $D_{max/min}$ | max/min roll diameter [m] |
| P | heat dissipated [kW] |
| m | roll maximum weight [kg] |
| Ts | web tension per centimeter [N/cm] |
| $L_{max}$ | max/min web width [cm] |

| | tensioning |
|---|---|
| $T_{max} = Ts \bullet L_{max}$ | maximum web tension |
| $T_{min} = Ts \bullet L_{min}$ | minimum web tension |
| $Cf_{max} = \frac{D_{max} \bullet T_{max}}{2}$ | maximum torque |
| $Cf_{min} = \frac{D_{min} \bullet T_{min}}{2}$ | minimum torque |
| $P = \frac{T_{max} \bullet v}{60 \bullet 10^3}$ | heat dissipated |

| | emergency stop |
|---|---|
| $Cf_{max} = \frac{m \bullet D_{max} \bullet v}{240 \bullet t}$ | torque |




## SPECIFIC TENSION VALUES FOR MATERIALS

| | paper | | | board | | |
|---|---|---|---|---|---|---|
| weight [g/m²] | 10 - 15 | 30 - 60 | 100 - 200 | 100 - 150 | 200 - 300 | 400 - 700 |
| web tension [N] per centimeter Ts | 0.3 - 0.4 | 1 - 2.5 | 3.5 - 7 | 5 - 7.5 | 10 - 11.5 | 16 - 18 |

| | cellophane | polythylene | polypropilene | aluminum |
|---|---|---|---|---|
| N/cm per μ of thickness | 0.042 | 0.01- 0.02 | 0.015 - 0.025 | 0.035 - 0.105 |

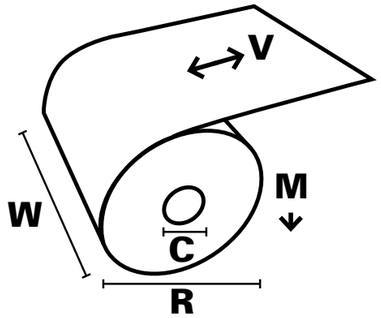


# QUESTIONNAIRE

**Please fill out the questionnaire, take a picture and send it via email to info@renova-srl.com**

## CUSTOMER

complete name
position
company
plant
country
tel
email
machine type
application




## APPLICATION DATA TEST BENCH

horizontal shaft ☐ vertical shaft ☐ other ☐

speed min.___/max.___ m/s
torque min.___/max.___ Nm
duty cycle ___ s
load cell present ☐ future ☐
torsiometer present ☐ future ☐
feedback present ☐ future ☐

## APPLICATION DATA CONVERTING

unwind ☐ rewind ☐
direct drive shaft ☐ parallel shaft mounting ☐
horizontal shaft ☐ vertical shaft ☐ other ☐

M - roll weight min.___/max.___ kg
C - core diameter min.___/max.___ mm
R - roll diameter min.___/max.___ mm
W - web width min.___/max.___ mm
V - speed min.___/max.___ m/s
tension force min.___/max.___ N
acceleration time ___ s
deceleration time ___ s
emergency stop ___ s
duty cycle ___ s
type of material ___
thickness ___ gr/m²
operating hours min.___/max.___ h
ambient temp. min.___/max.___ °C

## REGULATION SYSTEM

| | present | future |
|---|---|---|
| manual control | ☐ | ☐ |
| open loop - follower arm | ☐ | ☐ |
| open loop - diameter measure | ☐ | ☐ |
| closed loop - force feedback | ☐ | ☐ |
| closed loop - dancer | ☐ | ☐ |
| special - speed follower | ☐ | ☐ |

**MADE IN ITALY**
Our products are 100% designed and made in Italy

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We provide solutions that increase productivity and safety levels while reducing maintenance costs and procedures

**SUPPORT**
Our staff is always available to answer your questions, also in the after-sales phase

**QUALITY**
All Renova's products are managed by TUV ISO 9001

**CUSTOM PROJECTS**
Projects large or small, we work with you to provide the solution that fits

**SUSTAINABILITY**
Sustainable products, sustainable company.
Renova has joined Erion


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