

Type 2RMH-HD

- Hollow Shaft Encoder - \varnothing 24 mm
- Hollow Bore: \varnothing 2 mm to \varnothing 6 mm
- Resolution up to 7.500 ppr
- IP 64 rating (*IP 50 for flat cable option*)

Electrical Specifications

| | |
|-------------------------------|---|
| Code: | Incremental |
| Resolution: | 1 to 7.500 ppr (pulses per revolution) |
| Supply Voltage: | 4,5 Vdc min. to 30 Vdc max. (45 mA max. - no load) ** |
| Output Voltage: | Low: 500 mV max. at 10 mA High: ($V_{in} - 0,6$) at -10 mA ($V_{in} - 1,3$) at -25 mA |
| Output Current: | 30 mA max. load per output channel ** |
| Frequency Response: | 200 kHz max. ** |
| Output Format: | Two channel (A, B) quadrature with Index (Z) and optional complementary (A-, B-, Z-) outputs |
| Phase Sense: | A leads B clockwise (CW) from the mounting end of the encoder |
| Index: | Gated with Channels A and B high |
| Accuracy: | +/- 26 arc-sec. |
| Outputs: | ASIC Push pull and Differential OL7272 Push-pull and Differential Line Driver 26C31 Differential Line Driver 5V output (with 5V input) |
| Electrical Protection: | Reverse polarity and output short circuit protected |
| Noise Immunity: | Tested to EN61000-6-2 : 2005 (industrial environments) Electromagnetic compatibility (EMC) and EN 61000-6-3 : 2007 (residential, commercial, and light-industrial environments) for Electromagnetic compatibility (EMC) |

**= It is recommended user not to combine max. value for all 3 parameters

Mechanical Specifications

| | |
|--------------------------------|---|
| Material: | Housing: Brass Cap: Electroplated Steel Aluminum (flat cable option) Hollow Shaft: Brass |
| Weight: | Encoder: ~ 35 gr (1,23 oz) Cable: 50 gr / meter (1,76 oz / meter) |
| Bearing Life: | > $1,9 \times 10^{10}$ revolutions at rated load |
| Bearing Pre-Load: | 1 to 3600 ppr 4 (N) 4000 to 5000 ppr 7 (N) 7500 ppr 10 (N) |
| Shaft Speed: | 12.000 rpm (max.) |
| Starting Torque: | < 0,005 Nm (0,708 oz-in) at 25° C |
| Mass Moment of Inertia: | 1,0 gcm ² ($1,42 \times 10^{-5}$ oz-in-sec ²) |
| Hollow Shaft Loads: | Axial: 40 N (9 lbs) max. Radial: 40 N (9 lbs) max. |

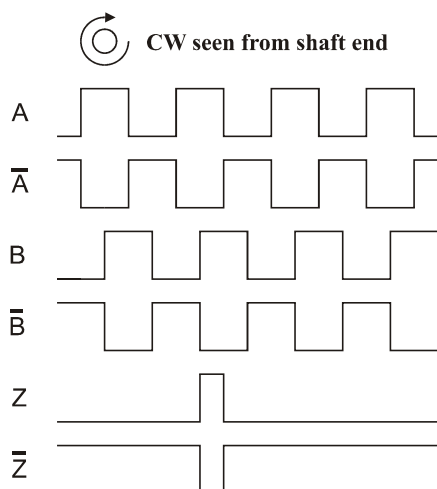
Environmental Specifications

| | |
|-------------------------|---|
| Operating Temp.: | -40° to +85° C |
| Storage Temp.: | -40° to +85° C |
| Shock: | 100 G / 11 ms |
| Vibration: | 10-2000 Hz / 10 G |
| Bump: | 10 G / 16 ms (1000 x 3 axis) |
| Humidity: | 98 % RH without condensation |
| IP Rating: | IP 64 / Nema 4 (approx.) IP 50 / Nema 5 (approx.) – flat cable |

Connection Options

| | |
|--------------------|--|
| Cable: | 8 leads (0,05 mm ² , 30 AWG) - Differential 5 leads (0,14 mm ² , 26 AWG) - Standard twisted pairs; shielded |
| Connector: | 5-pin M9 8-pin M9 |
| Flat Cable: | 10 lead flat cable with IDC connector |

Output waveform



Channel tolerance **180 e° +/- 36 e°**
 Phase difference tolerance **90 e° +/- 18 e°**
 Z channel tolerance **90 e° +/- 18 e°**

Disk Resolutions (pulses per revolution)

| | | | | |
|-----|------|------|------|--------|
| 1* | 36* | 150* | 512 | 3000 |
| 4* | 50* | 180* | 600 | 3600 |
| 10* | 60* | 200* | 1000 | 5000 |
| 11* | 64* | 250* | 1024 | 7500** |
| 12* | 75* | 256* | 1250 | |
| 15* | 90* | 300* | 1800 | |
| 20* | 100* | 360* | 2000 | |
| 25* | 125* | 400 | 2048 | |
| 30* | 128* | 500 | 2500 | |

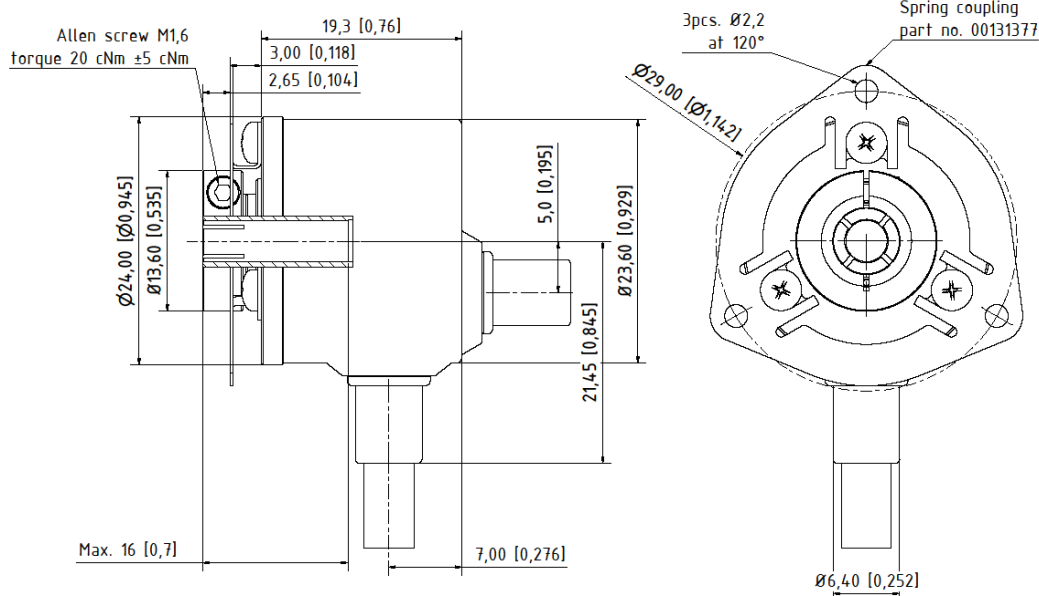
Other options on request

Pulses per revolution,
 min. 1 – max. 7.500

* *Delivery time: 6 weeks*

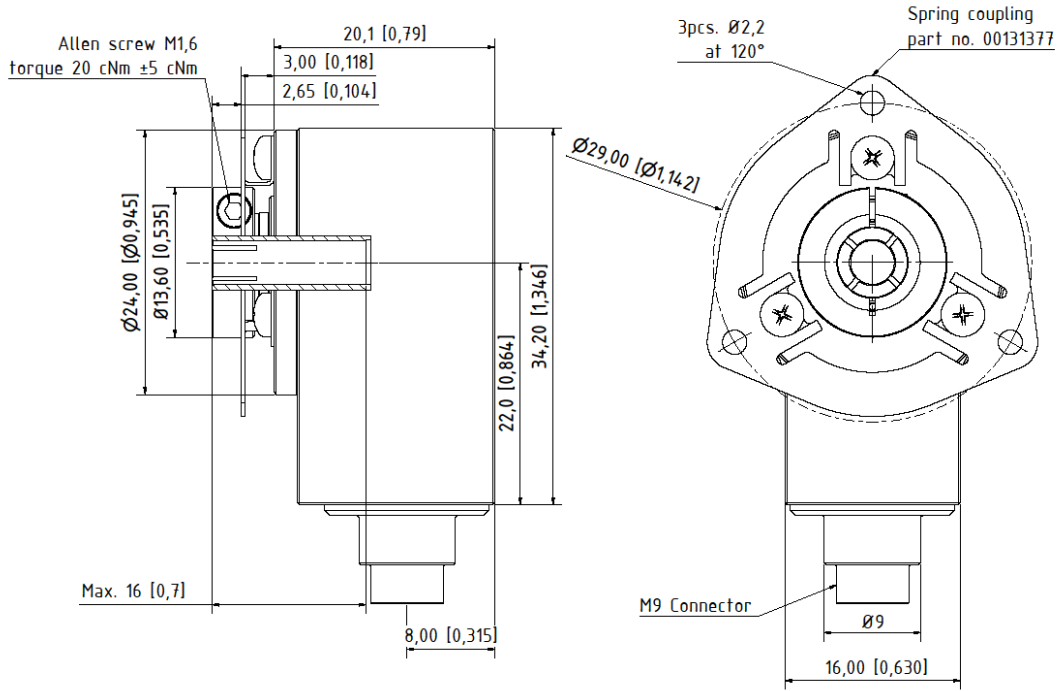
** *Operating temperature: -20° C to 50° C*

Mechanical Dimensions



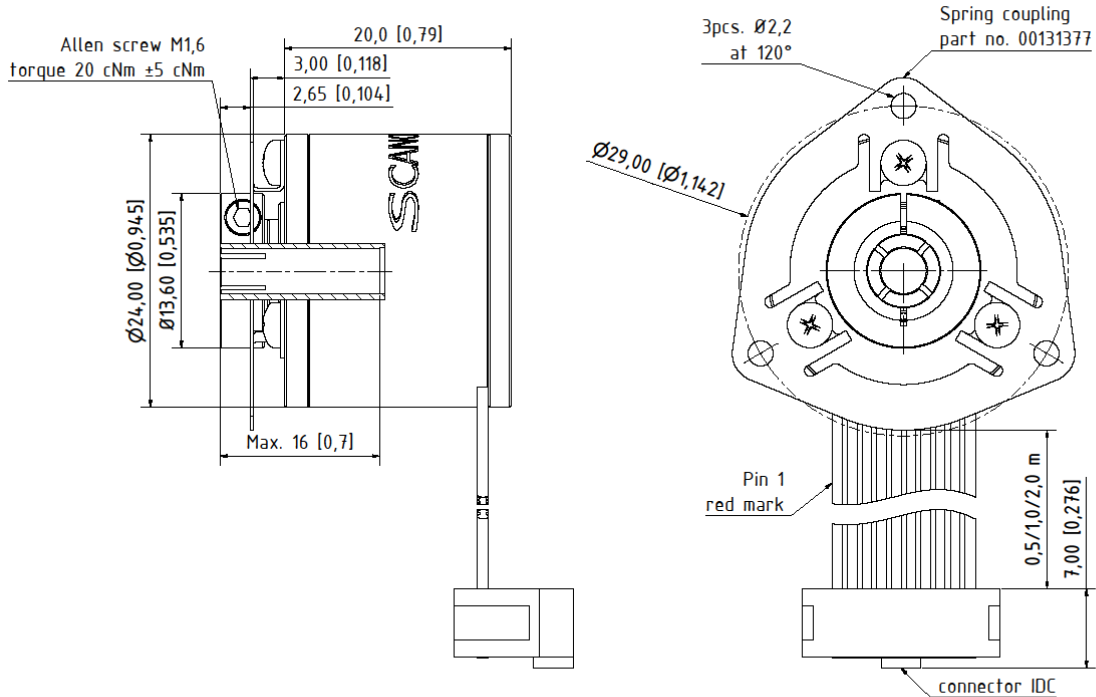
Standard Cable Gland
Side (S) or Back (B)

mm (inches)



M9 Connector

mm (inches)



Flat Ribbon Cable with IDC connector

mm (inches)

Output Terminations

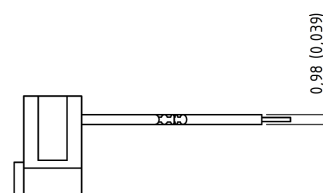
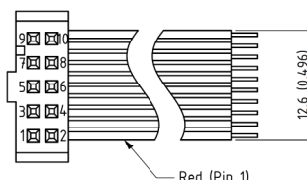
| Channel | Standard Cable | |
|---------|-----------------|---------------------|
| | Standard Output | Differential Output |
| | Wire Color | |
| A | Green | Pink |
| A - | NC* | Gray |
| B | Yellow | Green |
| B - | NC* | Yellow |
| Z | Gray | White |
| Z - | NC* | Brown |
| Vsup | Brown | Red |
| GND | White | Blue |

GND = Circuit Ground

* Internally connected as GND

| Flat Cable w/ IDC Connector | |
|-----------------------------|---------|
| Differential Output * | |
| Position | Channel |
| 1 | NC |
| 2 | Vsup |
| 3 | GND |
| 4 | NC |
| 5 | A |
| 6 | A - |
| 7 | B |
| 8 | B - |
| 9 | Z - |
| 10 | Z |

* Hewlett Packard (HP) compatible



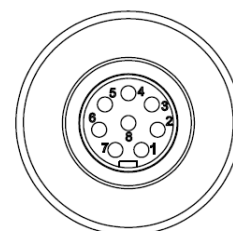
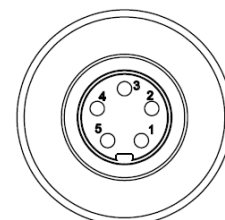
- IP 50 rating
- CE mark not available
- 0,5 m, 1 m, or 2 m cable length only

Cable Tolerances

| | Cable Length | Tolerances |
|-------------|---------------------------------|-----------------|
| | Flat Cable | 0,5 (= 0,5 m) |
| 01 (= 1 m) | | +/- 15 mm |
| 02 (= 2 m) | | +/- 20 mm |
| Round Cable | 01 (= 1 m) | Min. XX - 15 mm |
| | XX (specified length) | |
| | XX ≤ 500 mm w/ connector | Min. XX - 10 mm |
| | 500 ≤ XX ≤ 1000 mm w/ connector | Min. XX - 15 mm |
| | XX > 1000 mm w/ connector | Min. XX - 20 mm |



| Position | M9 5 - pin Standard Output | M9 8 - pin Differential Output |
|----------|----------------------------|--------------------------------|
| | Channel | Channel |
| 1 | VDD | VDD |
| 2 | GND | GND |
| 3 | A | A |
| 4 | B | A - |
| 5 | Z | B |
| 6 | | B - |
| 7 | | Z |
| 8 | | Z - |



GND = Circuit Ground

Ordering Code

Example: 2RMH-HD - 1024 - D - 04 - 16 - 64 - 01 - S - 00 - S5

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------|--|--|----------------------------|--|--|---|-----------------------|--|----------|--------------------------------|--------------|---------------------|---------------------|---------------------------------|-------------------|---------------------|---|--|-----------------------|---------------|---------------------|---------------------|----------------|---------------------|---------------------|------------------|--------------------------|---------------------|-----------|------------|---------------------|-----------|--------------------|-----------|-----------|--|--|
| 2RMH-HD | - | - | - | - | 16 | - | - | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pulses per Revolution | | Output | Hollow Shaft Dia. | Hollow Shaft Length | IP Rating | Cable Length | Cable Takeout | Connector | Spring Coupling | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| See table | | | | | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>IP 50</td><td style="text-align: right;">50*</td></tr> <tr><td>IP 64</td><td style="text-align: right;">64</td></tr> </table> <p><small>* = Only flat cable</small></p> | IP 50 | 50* | IP 64 | 64 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IP 50 | 50* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IP 64 | 64 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Standard</td><td style="text-align: right;">N</td></tr> <tr><td>Standard - Open Collector NPN</td><td style="text-align: right;">NON</td></tr> <tr><td>Standard - Open Collector PNP</td><td style="text-align: right;">NOP</td></tr> <tr><td>Differential</td><td style="text-align: right;">D</td></tr> <tr><td>26C31 Line Driver 5V / 5V only</td><td style="text-align: right;">L</td></tr> <tr><td>OL 7272 Line Driver</td><td style="text-align: right;">M</td></tr> <tr><td>Standard - with built-in TSM **</td><td style="text-align: right;">T</td></tr> </table> | Standard | N | Standard - Open Collector NPN | NON | Standard - Open Collector PNP | NOP | Differential | D | 26C31 Line Driver 5V / 5V only | L | OL 7272 Line Driver | M | Standard - with built-in TSM ** | T | | | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td colspan="2">Standard Cable</td></tr> <tr><td>Standard is 1 meter</td><td style="text-align: right;">01</td></tr> <tr><td>Specify length</td><td style="text-align: right;">XX</td></tr> <tr><td>No Cable</td><td style="text-align: right;">00</td></tr> <tr><td colspan="2">Flat Cable w/ IDC</td></tr> <tr><td>0,5 meter</td><td style="text-align: right;">0,5</td></tr> <tr><td>1 meter</td><td style="text-align: right;">01</td></tr> <tr><td>2 meters</td><td style="text-align: right;">02</td></tr> </table> | Standard Cable | | Standard is 1 meter | 01 | Specify length | XX | No Cable | 00 | Flat Cable w/ IDC | | 0,5 meter | 0,5 | 1 meter | 01 | 2 meters | 02 | | | |
| Standard | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard - Open Collector NPN | NON | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard - Open Collector PNP | NOP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Differential | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26C31 Line Driver 5V / 5V only | L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OL 7272 Line Driver | M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard - with built-in TSM ** | T | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard Cable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard is 1 meter | 01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Specify length | XX | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No Cable | 00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flat Cable w/ IDC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0,5 meter | 0,5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 meter | 01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 meters | 02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 3 mm x 16 mm | 03 | - | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 mm x 16 mm | 04 | - | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 mm x 16 mm | 06 | - | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Side (radial) | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Back (axial) | B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flat Cable (radial) | SF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Connector | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Side (radial) | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Standard Cable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M9 5-pin | M9/5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M9 8-pin | M9/8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No Connector | 00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flat Cable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IDC on flat cable* | IDC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>1 hole</td><td style="text-align: right;"><i>p/n 70137434</i></td><td style="text-align: right;">S1</td></tr> <tr><td>1 hole</td><td style="text-align: right;"><i>p/n 80147180</i></td><td style="text-align: right;">S2</td></tr> <tr><td>2 holes</td><td style="text-align: right;"><i>p/n 80149654</i></td><td style="text-align: right;">S3</td></tr> <tr><td>2 holes</td><td style="text-align: right;"><i>p/n 80149578</i></td><td style="text-align: right;">S4</td></tr> <tr><td>3 holes</td><td style="text-align: right;"><i>p/n 80139791</i></td><td style="text-align: right;">S5</td></tr> <tr><td>3 holes</td><td style="text-align: right;"><i>p/n 80131377</i></td><td style="text-align: right;">S6</td></tr> <tr><td>2 holes</td><td style="text-align: right;"><i>p/n 80140700</i></td><td style="text-align: right;">S7</td></tr> <tr><td>3 holes</td><td style="text-align: right;"><i>p/n 80141752</i></td><td style="text-align: right;">S8</td></tr> <tr><td>No spring coupling</td><td></td><td style="text-align: right;">00</td></tr> </table> | 1 hole | <i>p/n 70137434</i> | S1 | 1 hole | <i>p/n 80147180</i> | S2 | 2 holes | <i>p/n 80149654</i> | S3 | 2 holes | <i>p/n 80149578</i> | S4 | 3 holes | <i>p/n 80139791</i> | S5 | 3 holes | <i>p/n 80131377</i> | S6 | 2 holes | <i>p/n 80140700</i> | S7 | 3 holes | <i>p/n 80141752</i> | S8 | No spring coupling | | 00 | | |
| 1 hole | <i>p/n 70137434</i> | S1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 hole | <i>p/n 80147180</i> | S2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 holes | <i>p/n 80149654</i> | S3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 holes | <i>p/n 80149578</i> | S4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| No spring coupling | | 00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Other options on request: Please contact Scancon A/S</p> | | | <p>** Designed specifically for Wind Power applications.</p> <p>See SCA24 COC under <i>Industries - Wind Power - SCA24</i> for additional conformity standards testing.</p> <hr/> <p>TSM = Transient Suppression Module</p> <hr/> <p>Available only as Standard output</p> | | | <p style="text-align: center;">See Accessories for drawings</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |