

DESCRIPTION

The DMV-100 Rotor Creep and Speed Detector has two purposes: to detect and annunciate slow rotor motion (creep) and to measure rotational speed (RPM). It notifies when machine is at standstill, safeguards against unexpected rotor motion, and provides RPM to external devices.

It consists of a VM 3.12 Capacitive Sensor, a 10-m (30-ft) extension cable, a DCC-631 Signal Conditioner, a 30-m (98-ft) power and output cable, and a DMV-100 Monitor (rack-mount unit).

The noncontact sensor detects rotor motion by sensing air gap variations as poles pass by. While machine operates, the conditioner produces a 1/pole pulse. Its primary relay activates when gap variation stops for over 25 seconds. **A 1/2 pole motion instantly de-energizes relay ($\Delta 5 \text{ mm (197 mils)}$).** The monitor displays rotor status (LEDs) and activates the main power relay for connection to automation system or annunciation devices. The pulse signal is processed by a programmable tachometer which displays real-time RPM and provides a proportional 4-20 mA output to external device.

DMV-100

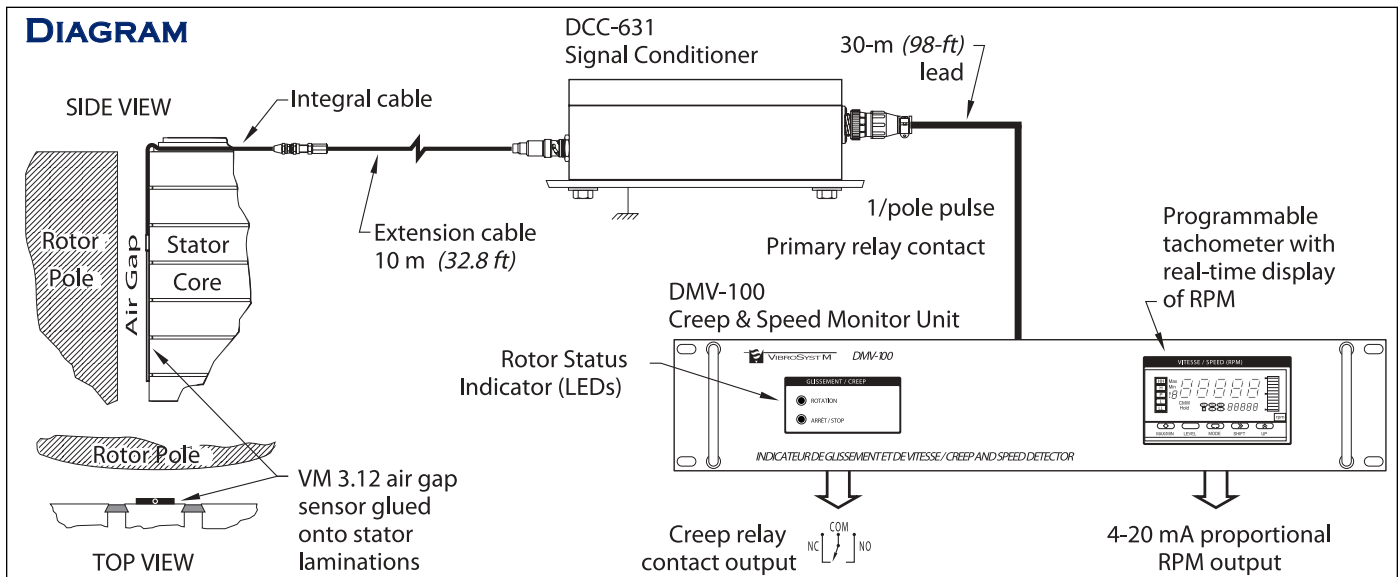
ROTOR CREEP AND SPEED DETECTOR

APPLICATIONS

- Detection of rotor motion and RPM on generators and large electric motors with salient poles;
- Notify automation system when the machine reaches standstill, safeguard against unexpected rotor motion;
- Provide RPM output to external instrumentation.

FEATURES

- Comprises:
 - VM 3.12 Air Gap Capacitive Sensor (noncontact, extended range: 5–50 mm / 200–2000 mils)
 - Fixed-length extension cable (10 m / 30 ft)
 - DCC-631 Signal Conditioner (built-in primary relay and 1/pole pulse outputs)
 - 30-m (98-ft) cable link
 - DMV-100 Monitor (2U rack-mount unit, built-in main power relay for creep, digital tachometer);
- Triggering incident:
 - non-changing air gap for a period of 25 seconds (i.e. rotor not in motion) energizes relay,
 - 1/2 pole motion **instantly** de-energizes relay ($\Delta 5 \text{ mm (197 mils)}$);
- Front-panel display of rotor status (LEDs – Rotation vs. Stop) and real-time rotational speed (5-digit meter);
- Outputs of creep detection (main power relay – NO and NC contacts available) to SCADA or annunciation device and proportional 4-20 mA signal of RPM to external metering or monitoring devices.





DMV-100 ROTOR CREEP AND SPEED DETECTOR

VM 3.12 MAIN SPECIFICATIONS

- Noncontact proximity measurement
- Passive device
- Stator-mounted sensor
- Capacitive measuring technology

Operation

- Linear Measuring Range Extended to 5 to 50 mm
(200 to 2000 mils)
- Sensitivity 0.9 mA/mm
(22.6 μ A/mils)
- Linearity <1.5%
- Frequency Response Limited by the conditioner
- Interchangeability < 5%

Environmental

- Temperature Range 0° to 125°C
(32° to 257°F)
- Magnetic Field Up to 1.5 tesla [50 or 60 Hz]
- Dust & Oil Contamination No effect

Connection

- Integral Cable Type Coaxial, Teflon coated
 - Connector Male SMA
 - Length 50 cm (19.7 in.)
- Extension Cable Type Triaxial, R6-59/u
 - Connectors Female SMA coaxial with ground lug on sensor end; Male bayonet triaxial on conditioner end
 - Length Fixed, 10 m (32.8 ft)

Dimensions

- Height 220 mm (8.700 in.)
- Width 33.25 mm (1.300 in.)
- Thickness 1.77 mm (0.070 in.)
- Clearance 3.4 mm (0.134 in.)

DCC-631 MAIN SPECIFICATIONS

- Small size enclosure, easy to install
- Cast aluminum alloy, bake painted, corrosion resistant
- Sealed recessed neoprene gasket (dust, oil, water)
- Mounting holes for M6-1.0 or 1/4-20 type screws

Contact Output (Built-in Primary Relay)

- Type Dry contact
SPST, normally opened
- Unit rotating Opened
- Unit stopped Closed, $t_{stop\ delay} > 25\ sec.$
- Sensitivity
 - Stopped to rotation Δ air gap > 5 mm (197 mils), Instantaneous
 - Rotation to stopped Δ air gap < 5 mm (197 mils), 25 sec. after stop

Pulse Output

- Type NPN, open collector
1 pulse per pole

Connection

- Sensor side (VM 3.12)
 - Connector Female bayonet
- DMV-100 Monitor side
 - Connector 9-pin male CPC socket
 - Cable 4-pair shielded
 - Length 30 m (98 ft) lead with female CPC socket at one end and flying leads at other end

Power Supply

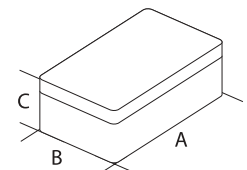
- Input Voltage +24 VDC \pm 15% [300 mA]
- Power Consumption 7 W
- Fuse 0.5 A slow-blow

Environmental

- Temperature Range
 - Operation 0° to 55°C (32° to 130°F)
 - Storage -40° to 80°C (-40° to 175°F)
- Humidity Up to 95% noncondensing

Dimensions

- Length (A) 220 mm (8.66 in.)
- Width (B) 120 mm (4.72 in.)
- Height (C) 80 mm (3.15 in.)
- Weight 1 kg (2.20 lb)





DMV-100 ROTOR CREEP AND SPEED DETECTOR

DMV-100 MONITOR UNIT MAIN SPECIFICATIONS

- 2U, 19" rack-mount
- Creep detection relay output
- Rotor status LED display (rotation/stop)
- Rotational speed 5-digit display and 4-20 mA output

Overall

Connection

- DCC-631 Power and Output Removable 8-screw terminal
- Relay Contact Output Removable 3-screw terminal
- RPM Output Removable 3-screw terminal
- Power from Main Removable 3-screw terminal

Supply

- Input Voltage 85-264 VAC, 105-370 VDC
- Input Frequency 47-440 Hz
- System-wide Consumption 15.9 W max
- Fuse Two 0.50 A, slow-blow

Environmental

- Temperature Range
 - Operation 0° to 50°C (32° to 122°F)
 - Storage -20°C to 65°C (-5° to 150°F)
- Humidity Up to 90% noncondensing

Dimensions

- Height 89 mm (3.5 in.)
- Width 483 mm (19.0 in.)
- Depth 305 mm (12.0 in.)
- Weight 7.25 kg (16 lb)

Creep Detection Section

- Input from DCC-631 Dry contact from primary SPST relay
- Front-panel LED Indicators
 - GREEN Rotor stopped, Relay energized
 - RED Rotor moving, Relay de-energized
- Output to user equipment Dry contact, DPDT relay Normally Opened (NO) and Normally Closed (NC) available, from main power relay
- State
 - System OFF As per DCC-631 output Opened / De-energized
 - Unit Rotating Opened / De-energized
 - Unit Stopped Closed / Energized
- Relay Power Requirement $t_{stop\ delay} > 25\ sec.$ +24 VDC
- Relay Contact Ratings
 - Limitations Resistive load
 - 10 A @ 24 VDC,
 - 0.5 A @ 110 VDC,
 - 5 A @ 250 VAC,
 - Maximum Voltage 250 VAC/125 VDC
 - Maximum Current 10 A
 - Switching Capacity 1100 VA, 240 W

Rotational Speed Detection Section

- Meter Digital tachometer, front-panel display / keypad, programmable RPM range
- Input Signal 1/pole pulse, NPN-type
- Input Range 0.0005 to 50,000 pulses/sec.
- Accuracy @ 23°C (±5°C) 0.006% of reading ±1 digit
- Internal Transfer Formula $RPM = nbr\ pulses/sec. \times 60 \times \alpha$ ($\alpha = 1/nbr\ poles$)
- Front-panel Display 5-digit LCD, real-time RPM
- Output Signal 4-20 mA, proportional to programmed RPM range
- Output Resistive Load 500 Ω max.

VibroSystM reserves the right to change specifications to improve products without notification.

* Protected by patents around the world: US patents 7,064,559; 6,307,385; 6,552,667; 6,075,464; 5,990,807; 5,182,612; and other patents pending.

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