

nexen[®]

WEB CONTROL PRODUCTS

User Manual



Web Volume Control Model WV220

In accordance with Nexen's established policy of constant product improvement, the specifications contained in this manual are subject to change without notice. Technical data listed in this manual are based on the latest information available at the time of printing and are also subject to change without notice.

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DANGER

Read this manual carefully before installation and operation.

Follow Nexen's instructions and integrate this unit into your system with care.

This unit should be installed, operated and maintained by qualified personnel ONLY.

Improper installation can damage your system or cause injury or death.

Comply with all applicable codes.

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ISO 9001 Certified

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INTRODUCTION

Nexen's WV220 Web Volume Control measures the remaining volume of web on an unwind roll. This volume may be displayed as either inches of remaining roll diameter or lineal feet of remaining web length. In addition, Nexen's WV220 can also display the web thickness.

The WV220 has two adjustable relay outputs. These outputs can be operator adjusted to give an output relay contact at two different volume levels. They may be adjusted to activate at a given diameter or number of remaining feet of web. Both must be set to the same standard; either diameter or remaining length.

WV220 is used as part of a system, coupled with an optical encoder to indicate line speed and volume, and a proximity switch to record the unwind roll rotations.

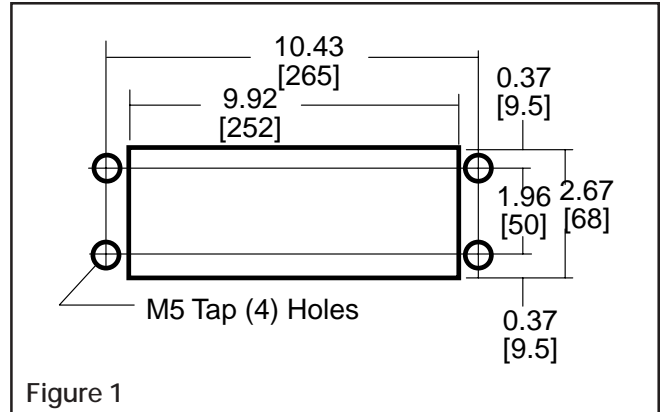
This system is ideal for use with a turret type unwind stand and a flying splice tension control system. WV220 can take an input signal from two different proximity switches (one for each roll on the turret). The controller will then read the signal from the proximity switch on Roll 1 when controlling Roll 1 and the signal from Roll 2 for Roll 2. One relay contact can be set to signal the rotation of the turret and acceleration of the next roll to splicing speed. The other contact can be set to initiate the actual splicing sequence (splice bar actuation, splice contact signal to the tension control, and cutoff knife actuation).

The system can also be used to signal a high-speed machine to slow to a lower speed when the unwind roll reaches a diameter that would cause critical RPM on the unwind brake and roll bearings. The second relay could then be used to signal machine stop when the web is almost depleted for the roll, but before it actually runs out. This will allow for a splicing tail to remain, speeding the roll change over time.

INSTALLATION

Nexen's WV220 is designed for easy panel mounting (See Fig. 1 for panel cutout dimensions).

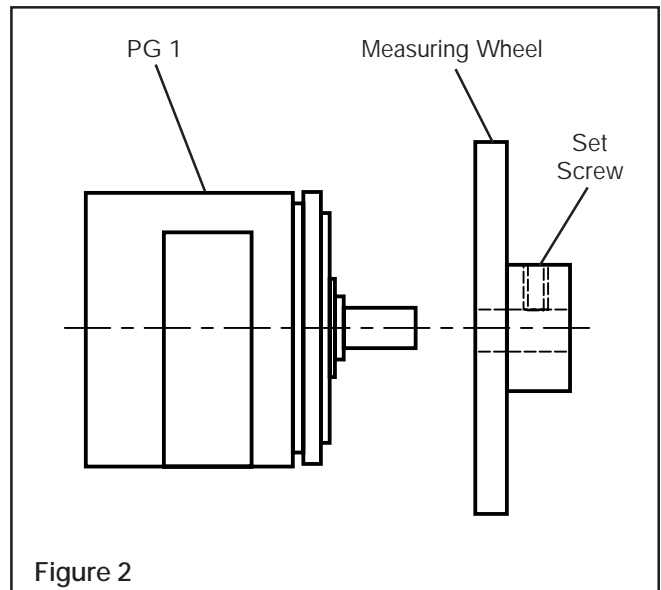
NOTE: Nexen's WV220 is an electronic instrument and should be mounted in a shock and vibration free area which has an ambient temperature of more the 32° F [0° C], and less than 122° F [50° C].



OPTICAL ENCODER (PG1)

1. The roll selected for line speed measurement via PG1 must turn exactly at line speed. There must not be any slippage between the web surface and the surface of this measuring roll. One of a pair of nip rolls is often a good choice for a measuring roll as the nip pressure ensures there will be no slip between web surface and roll surface.
2. Using set screw provided, securely attach measuring wheel PG1 to shaft of PG1 (See Fig. 2).
3. Using customer supplied mounting bracket, mount PG1 in such a way as to bring the wheel into contact with the measuring roll.

NOTE: Contact between wheel and measuring roll must be firm enough to prevent slippage between wheel and measuring roll.



4. The Optical Encoder can also be coupled directly to the measuring roll with a customer supplies coupling. In this case the measuring wheel may be discarded.

NOTE: Make sure that the measuring roll chosen for a direct coupled installation has the correct diameter to satisfy the mathematical requirements specified in Section IV.

PROXIMITY SWITCH (PG2 & PG3)

1. The Proximity Switch senses a customer supplied ferrous material (iron or steel) target. Minimum gap between the Proximity Switch and target is .20 inches [5 mm], maximum gap is .40 inches [10 mm]. The target must be at least 2 inches [50 mm] high, and may be mounted to the roll shaft or any other mechanical element which rotates at the same speed as the roll shaft, brake, rotor, etc. (See Fig. 3).

NOTE: Target duration may be from 22° to 45° shaft rotation.

2. Mount the Proximity Switch to a non-rotating member using mounting bracket provided.

NOTE: The Proximity Switch must be mounted in such a position as to maintain correct gap.

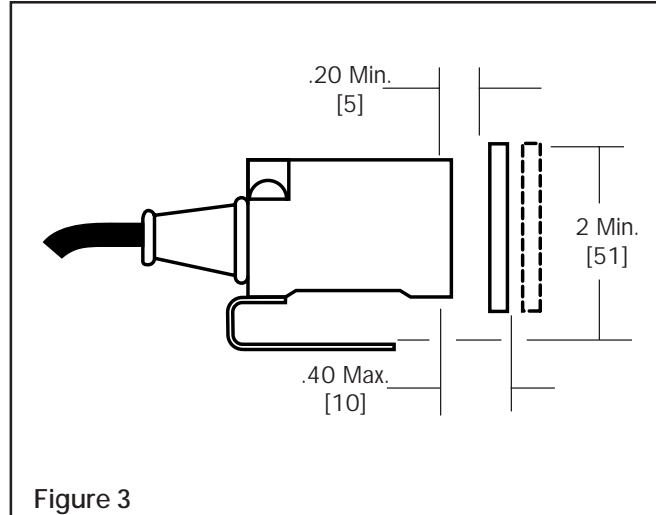
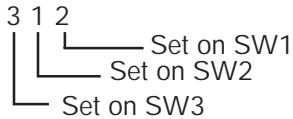


Figure 3

INITIAL SETUP

1. Remove five Phillips head screws and top cover of WV220 (See Fig. 4)
2. Select power supply. WV220 can be used with 100, 110, 200, or 220VAC, 50 or 60HZ, single phase. To use 200 or 220VAC, no change is required. If power supply is to be 100 or 110VAC, install jumper (included in the accessory bag) on CN5 (See Fig. 5).
3. Define Pulses Per Revolution (PPR) of PG1 using switches SW1, 2, and 3. (See Fig. 6)

NOTE: PPR (Pulses Per Revolution) for Nexen Optical Encoder (Product No. 912666) is 312.



These Switches can be set for 001 to 999 PPR.

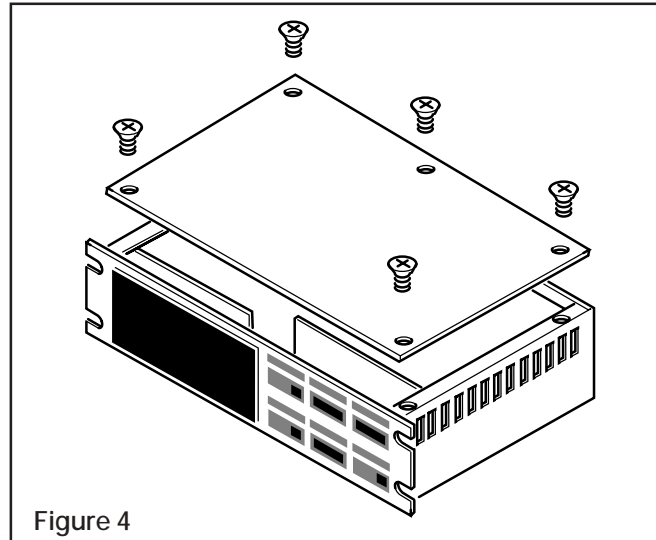


Figure 4

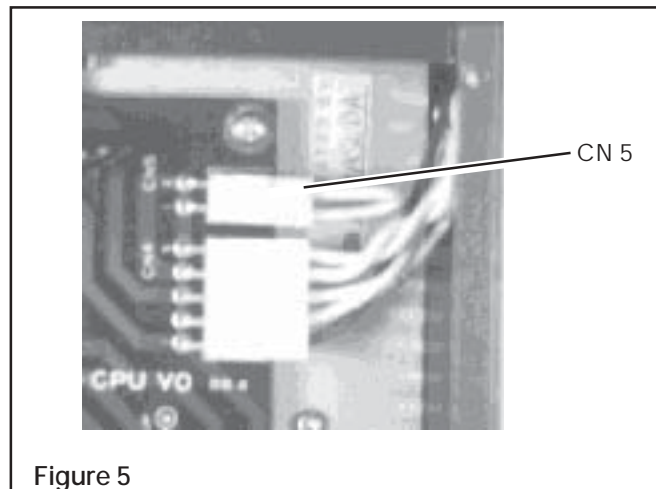
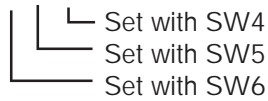


Figure 5

4. Define Measuring Roll Diameter (*When using a direct coupled PG1*) or Measuring Wheel diameter (*When using the wheel provided with PG1*) in millimeters using **SW4, 5, and 6** (See Fig. 6).

(Measuring Roll Diameter)

0 9 8



NOTE: If you use the wheel that is provided with Nexen's Optical Encoder, 912666, the diameter is 3.83 inches [98 mm]. If the Optical Encoder is direct coupled to the measuring roll, use the diameter of the measuring roll.

5. Check settings of Switch DSW-1 on printed circuit board (See Fig. 7)
- Switches DSW1-1, and DSW1-2 set the number of revolutions required to calculate the web thickness. Normal setting, (as delivered from the factory) is both switches set to "ON". For web less than 0.002 [80 mm] thick, see Table 1.
 - Switches DSW1-3, and DSW1-4 are set to the maximum error per revolution for the Optical Encoder PG1. When using the Optical Encoder (Product No. 912666) supplied by Nexen, use a maximum error value of 32 or DSW1-3 "OFF", and DSW1- 4 "ON". See Table 2.

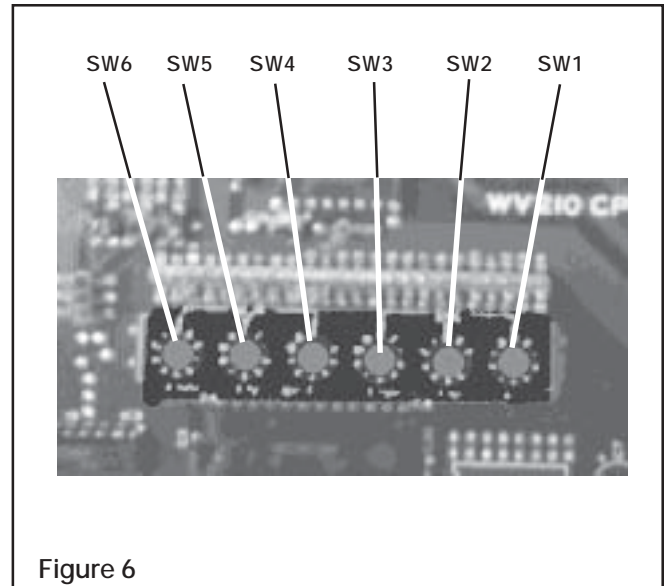


Figure 6

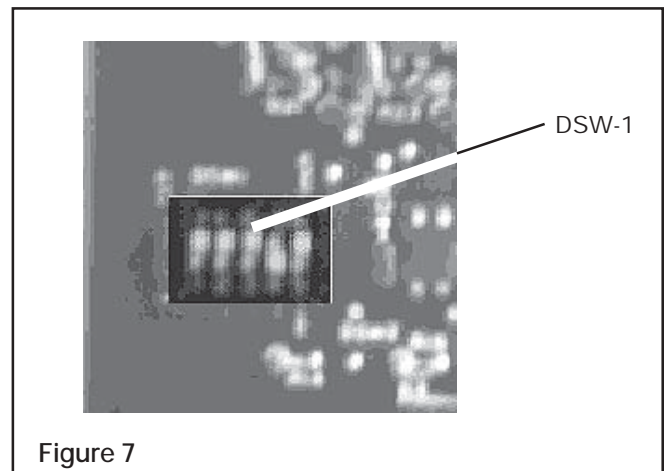


Figure 7

Table 1

WEB THICKNESS	REVS	DSW1-1	DSW1-2
≥ 0.002 in [80 mm]	64	ON	ON
0.001-0.002 in x [79mm]	128	OFF	ON
0.005-0.001 in [39 mm]	256	ON	OFF
≤ 0.005 in [19 mm]	384	OFF	OFF

Table 2

MAXIMUM ERROR IN PULSES/REVOLUTION				
	32	64	128	Not Used
DSW1-3	OFF	ON	OFF	ON
DSW1-4	ON	OFF	OFF	ON



PG 1 SELECTION

SPECIFICATIONS

1. Use Nexen Product No. 912666, or select a model which meets the following specifications:

Operating Voltage	12VDC
Response Frequency	10KHz Maximum
Current Consumption	100mA Maximum
Ambient Temperature	14° to 120° F [-10° to -60° C]
Signal Output	"1" 10–12VDC "0" 0–1VDC (10mA)
Pulses Per Rev (ppr)	≤ 999

2. Select a model which will deliver at least twenty five pulses per one inch of web travel ($P \geq 25 \times \pi \times d$).

Where $P =$ ppr of the encoder
 $d =$ diameter of the measuring roll in inches.

NOTE: ppr cannot exceed 999

3. Select a model where the number of pulses will be less than 6000 for one rotation of the unwind roll at maximum diameter

$$\frac{D \times P}{d} < 6000$$

Where D = Maximum unwind roll diameter.

4. Select a model where the maximum input frequency to WV220 is 10KHz or less ($f \leq 10K$ Hz).

$$f = \frac{\pi \times 12 \times P}{\pi \times d \times 60}$$

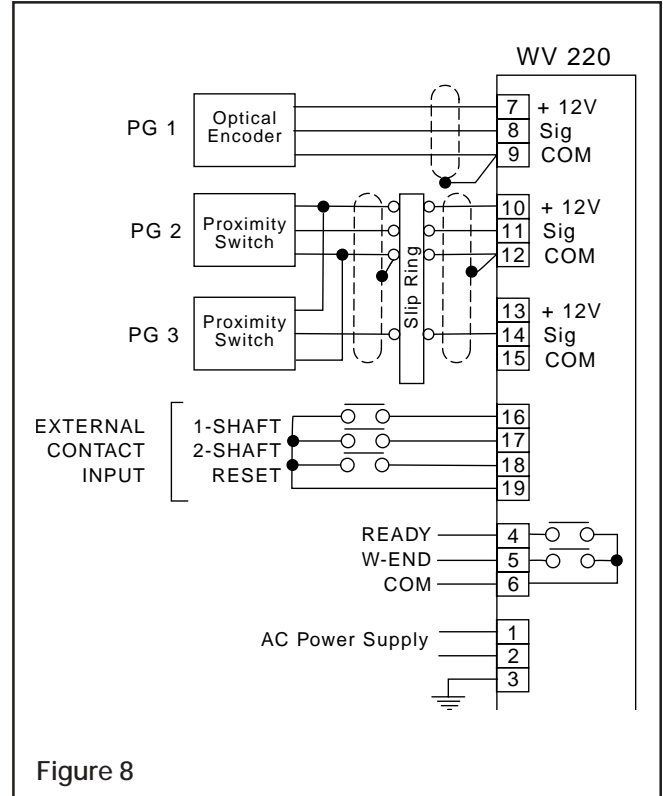
f = Input frequency
Where V = Maximum web speed (fpm)

ELECTRICAL CONNECTIONS

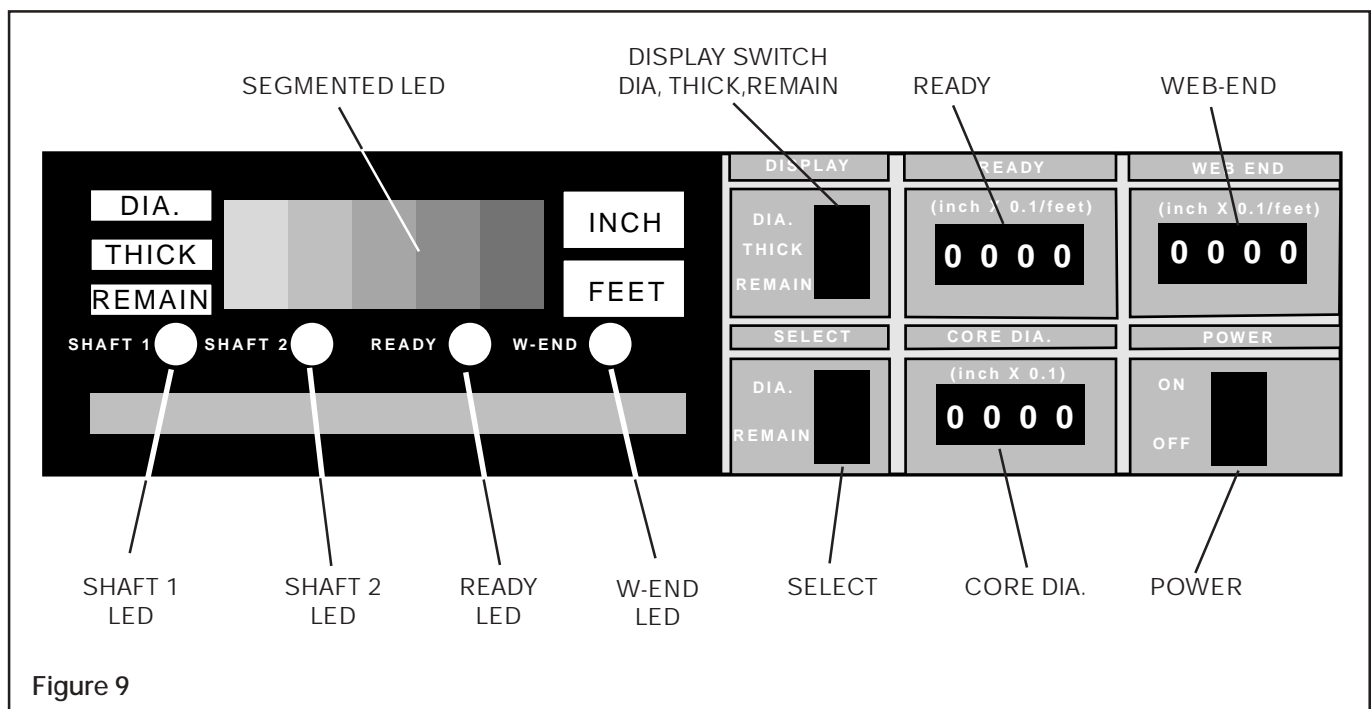
- Power Supply at Terminals 1 and 2 may be 100, 110, 200, and 220VAC, 50 or 60 Hz, single phase. Ground is at Terminal 3.

NOTE: Jumper Wire must be attached to CN5 when using 100 or 110VAC (See INITIAL SETUP, Step 2).

- Relay closure to indicate "Ready" is available at Terminals 4 and 6. This is normally open (N.O.).
- Relay closure to indicate "Web End" is available at Terminals 5 and 6. This is normally open (N.O.).
- An external dry contact switch or relay can be connected across Terminals 16 and 19 to indicate that Shaft 1 is in operation.
- An external, dry contact switch or relay can be connected across Terminals 17 and 19 to indicate Shaft 2 is in operation.
- An external, dry contact, momentary contact, must be provided at Terminals 18 and 19 to provide a reset signal when one roll has depleted and the next one is about to run.



OPERATION (See Fig. 9)



FRONT PANEL COMPONENTS

1. **DIA**, **THICK**, and **REMAIN** lamps; 5 segment LED; **INCH** and **FEET** lamps; and **DISPLAY** switch. These components combine to read out the web condition as directed by the **DISPLAY** switch, which may be in any of three positions.

- a. **DIA** position will cause the panel to display **DIA** and **INCH** and the 5 segment LED to read out in the range of 0000.0 to 9999.9. This is the current roll diameter.
- b. **THICK** position will cause the panel to display **THICK** and **INCH**, and the LED to read out in the range of 0.0001 to 9.9999. This is the actual thickness of the web.
- c. **REMAIN** position will cause the panel to display **REMAIN** and **FEET** and the LED to read out in the range of 00001 to 99999. This is the number of feet of web remaining on the roll.

2. **READY** digital switch; **WEB END** digital switch; **SELECT** switch; and **READY** and **W-END** LEDs. These components combine to define and display the two programmable relay contacts. **SELECT** switch defines the values dialed into the **READY** and **WEB END** rotary switches.

- a. If the **SELECT** switch is set to **DIA** the **READY** switch sets the trigger point for the Ready contact in the range of 000.1 to 999.9 inches of remaining roll diameter. The **WEB END** switch sets the Web End trigger point in the range of 00.1 to 99.9 inches of remaining diameter.
- b. If the **SELECT** switch is set to **REMAIN** the **READY** switch sets the trigger point at 0001 to 9999 feet of remaining web length and the

WEB END switch defines the Web End point at 001 to 999 feet of remaining web length.

- c. At the time that the web reaches the **READY** trigger point (whether diameter or remaining length) the Ready relay contact (Terminals 4 and 6) will close and the **READY** LED lamp will glow. To prevent false triggering WV220 will not change the relay state or light the lamp until the trigger point is achieved for three consecutive rotations of the unwind roll.
- d. **W-END** LED lamp glows and the Web End relay contact (Terminals 5 and 6) closes when WV220 reaches the Web End trigger point for three consecutive rotations.

3. **CORE DIA** rotary switch defines the outside diameter of the roll core to WV220. Diameter is expressed as 00.1 to 99.9 inches.

NOTE: CORE DIA must be the outside diameter of the core.

4. **POWER** switch applies AC power to WV220.
5. **SHAFT 1** and **SHAFT 2** LED lamps are used when WV220 is timing the sequence of a turret type roll stand for flying splices. When the control is used for this purpose, there are two proximity switches, one for each roll. When contact is made from Terminals 16 to 19 the **SHAFT 1** lamp glows and WV220 reads the proximity switch counts from Terminals 10, 11, and 12. When contact is made from Terminals 17 to 19 **SHAFT 2** lamp lights and WV220 reads the proximity switch signal from Terminals 10, 12, and 14.

OPERATING TECHNIQUES

1. Flying Splice Turret Control

When WV220 is used for control of turret sequencing the **READY** contact closure is normally used to activate the circuitry, which rotates the turret into the Ready to splice position and accelerates the new roll to splicing speed.

The **WEB END** contact closure normally triggers the circuitry which makes the actual splice, fires the cutoff knife, signals the tension control system to enter its splicing mode, and shifts tension control from "old" brake to "new" brake.

2. High-Speed Winder Control

On high-speed winders the rpm of the unwind roll increases as the roll diameter increases. Near the core this speed can be damaging to bearings, brakes and other unwind stand components. The trigger point for the WV220 **READY** contact can be set before this critical speed is reached. The **READY** contact closure can then be used to signal the drive to decrease speed.

The **WEB END** contact can then be set to signal a machine stop before the roll runs out completely, thus leaving a splicing tail.

3. Reading Out Web Data

The Display Switch can be used at any time during the unwind to read out roll diameter, web thickness, or remaining feet of web on the roll. This switch can be changed any number of times without causing any control problems.

WARNING

Never change Select Switch from DIA to REMAIN after the READY and WEB END set points have been dialed in. Doing so will radically change the set points. As an example; a READY signal set for 006.0 inches of roll diameter would become 0060 feet of remaining web length. Six inches of diameter may take several minutes to run out, allowing time to rotate the turret and accelerate the new roll. Sixty feet of web may disappear in a few seconds.

WV-220 SPECIFICATIONS

AC Power	100, 110, 120, 200, 220, or 240 VAC 50 or 60 Hz
Power Consumption	40 VA or less
Temperature Range	32°–120°F [0°–50°C]
Output Contact Rating	200 VAC, 0.5A
Max Input Frequency	10 KHz (PG1)

PG–1 SPECIFICATIONS (NEXEN PROD. NO. 912666)

Supply Voltage	12 VDC \pm 10%
Pulses Per Revolution	312
Current Draw	100 mA
Output Signal	"1" \geq 10 VDC "0" \leq 1 VDC
Frequency Response	50 KHz.
Measuring Wheel (Provided with 912666)	12 inch Circumference (305 mm)

PG2 & PG3 SPECIFICATIONS (NEXEN PROD. NO. 912068)

Supply Voltage	12 VDC \pm 10%
Current Draw	10 mA
Output Signal	"1" \geq 10 VDC "0" \leq 1 VDC
Frequency Rseponse	500 Hz

WARRANTIES

Warranties

Nexen warrants that the Products will be free from any defects in material or workmanship for a period of 12 months from the date of shipment. NEXEN MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. This warranty applies only if (a) the Product has been installed, used and maintained in accordance with any applicable Nexen installation or maintenance manual for the Product; (b) the alleged defect is not attributable to normal wear and tear; (c) the Product has not been altered, misused or used for purposes other than those for which it was intended; and (d) Buyer has given written notice of the alleged defect to Nexen, and delivered the allegedly defective Product to Nexen, within one year of the date of shipment.

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The exclusive remedy of the Buyer for any breach of the warranties set out above will be, at the sole discretion of Nexen, a repair or replacement with new, serviceably used or reconditioned Product, or issuance of credit in the amount of the purchase price paid to Nexen by the Buyer for the Products.

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In no event shall Nexen be liable for any consequential, indirect, incidental, or special damages of any nature whatsoever, including without limitation, lost profits arising from the sale or use of the Products.

Warranty Claim Procedures

To make a claim under this warranty, the claimant must give written notice of the alleged defect to whom the Product was purchased from and deliver the Product to same within one year of the date on which the alleged defect first became apparent.

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