AVTRON™ ENCODERS

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ENCODER INSTRUCTIONS

XR115 SMARTSafe™

115mm FLANGE MOUNT MODULAR FOR HAZARDOUS APPLICATIONS

DESCRIPTION

The Avtron XR115, SMARTSafe™ is a modular, two piece incremental encoder for hazardous atmosphere applications (also known as a tachometer or rotary pulse generator). It provides a two phase, A Quad B frequency (pulse) output, with complements. The XR115 mounts on a 115mm (NEMA FC) face, also known as a B-Flange.

CAUTION
The XR115 is designed for use in hazardous applications which require protection from gas or dust ignition for safe operation. Proper selection, wiring and installation procedures are essential to ensuring safe conditions.

Because the XR115 is modular, there are no bearings or couplings required. This, combined with the latest magnetoresistive (MR) sensor technology, allows the XR115 to provide superior mechanical performance and increased reliability.

An Avtron XR115 can be configured with one or two independent outputs. Each output has six signals: (A, B) 90° out of phase, with complements ($\overline{A}$, $\overline{B}$). A marker pulse with complement (Z, $\overline{Z}$) is also provided.

Output resolution on the XR115 is determined by the sensor only. Unlike older models, any PPRs can be mixed and matched. Selection of the rotor is based only on the shaft mounting requirements (and not PPR).

ADAPTIVE ELECTRONICS

A perfect duty cycle consists of a waveform whose “high” and “low” conditions are of the same duration (50%/50%). It is possible over time for the duty cycle and edge separation to change due to component drift, temperature changes, or mechanical wear. The Adaptive Electronics extend the life of the XR115 by constantly monitoring and correcting duty cycle and edge separation over time.

INSTALLATION

WARNING
Installation should be performed only by qualified personnel. Safety precautions must be taken to ensure machinery cannot rotate and all sources of power are removed during installation.

Refer to the following attached installation drawings for installation information appropriate for specific hazardous locations:
D53008: ATEX / IECEx Zone 1, 21
D52353: ATEX / IECEx Zone 2, 22
D52354: US and Canada Class I Division 1 Encoder
D52355: US and Canada Class I Division 2

NOTE:
The equipment is intended for a fixed installation and should be mounted so as to avoid electrostatic charging. The XR115 is not considered as a safety device and is not suitable for connection into a safety system.

The XR115’s construction materials contain no more than 7.5% in total by mass of magnesium, titanium and zirconium. These materials are not considered as able to trigger an explosion in normal operating modes. These materials are not known to react with any explosive atmospheres to which the XR115 may be subject. It is however the responsibility of the end user to ensure that the XR115 is selected correctly for the potentially explosive atmosphere in which the equipment is to be put into service.

The XR115 installation is similar to AV115. Installation and removal videos for the AV56/67/85/115 are available on Avtron’s web site. Refer to the back page of these instructions for outline and mounting dimensions. The motor must comply with 1998 NEMA MG 1, section 4, for tolerances on diameters and runout for shafts and accessory faces. Axial float or endplay plus rotor location tolerance must be less than ±1.27mm.

In preparation for installing the Model XR115 encoder, it is first necessary to clean both the accessory motor shaft and the mounting face. These surfaces must be inspected and any paint, burrs, or other surface imperfections removed.

Installation procedures should be performed only by qualified personnel. Safety precautions must be taken to ensure machinery cannot rotate and all sources of power are removed during installation.

ROTOR INSTALLATION

The motor shaft must project at least 16.7mm from the motor face. For set screw rotors only: Apply anti-seize compound to the motor shaft. For all rotors: Slide the rotor onto the shaft with the marking “Motor side” facing in, (toward the motor face). The rotor centerline must match the sensor centerline. To accomplish this, use the rotor locating gauge (A28503) and slide the rotor onto the shaft until it is in the proper position as shown in Figure 1. If a guage is not available, use the stator housing alignment grooves as shown in Figure 3.

STANDARD CAM SCREW ROTOR INSTALLATION

Turn the cam screws of the rotor in the directions shown on the rotor to engage the cams. Tighten to 50-60 in-lb [5.6 - 6.8 N-m] (See Figure 2) using the 3mm hex wrench. Total cam screw rotation will be less than one turn.

CAUTION
Do not adjust the cam screws before motor shaft mounting; bottoming out the screws, or backing them out excessively, can lead to insufficient shaft holding force. Thread locker is preapplied on the cam screws.

LARGE BORE SET SCREW ROTOR INSTALLATION

Apply thread locker to the rotor set screw holes, preferably from the inside of the rotor bore before mounting. Tighten the rotor set screws to 2 N-m using the 2mm T-handle hex wrench.

CAUTION
Use only a T-handle or torque hex wrench to tighten set screws; using a right angle wrench will not provide enough holding force, and the rotor may slip.

STATOR HOUSING INSTALLATION

The stator housing is attached to the motor using four socket head cap screws M10 x 20, locating on a 150mm bolt circle. Longer bolts (not included), are required for sandwich installation between a motor and a brake. Install the four mounting bolts using thread locker and torque to approximately to 27-40 N-m using the 8mm T-handle hex wrench.

VERIFY ROTOR LOCATION

To ensure the rotor is properly located on the shaft: remove the back cover if factory-preinstalled, and verify that the outer face of the rotor is at the same depth as the alignment grooves, using a straight edge tool. (Fig. 3)

CAUTION
Do not use silicone sealants or caulk of any kind on the motor or encoder face; these can cause misalignment or sensor scraping damage. The XR115 electronics are fully sealed; water may enter and leave the rotor area as needed. A drain hole option is available if frequent moisture buildup is expected.

COVER INSTALLATION

Covers must not interfere with the motor shaft or rotor. The longest shaft that can be used without interfering is 18.3mm with a standard flat cover (Cover Style option “F”) and 64.8mm with an extended “pie pan” cover (Cover Style option “E”). Through shaft covers with seals are available for other applications (Cover Style option “T”).

EXTENDED COVER MOUNT

(Cover Style option “E”)
The extended cover mounts to the encoder housing using quantity 4 #6-32 x 0.31” screws, lock washers, and thread locker.

THRU SHAFT AND FLAT COVER INSTALLATION

(Cover Style option “T” and “F”)
The housing has a machined step in the outboard face to accept the cover and a recessed groove for the retaining ring. Insert the cover, line up ears on cover, smooth side facing out, fully into the machined step until it seats against shoulder. Using a spiral assembly method, install the retaining ring by first inserting the squared off end into the machined groove. Flex the ring and insert it into the groove walking it around the perimeter (A flat blade screwdriver can be used). Final position should have the ring fully seated into groove. Remove the cover by reversing above procedure, starting with the tang end.

WIRING

Refer to the attached installation drawings referenced above for wiring diagrams. Use the drawing appropriate for the encoder’s installation location. Information on specific connector pin-outs and phasing can be found on labels on the encoders and in the tables included in these instructions.

The XR115 can be wired for single phase or two phase, either with or without complements, with or without markers. For bidirectional operation, Phase A channel typically leads phase B channel for clockwise shaft rotation as viewed from the anti-drive or accessory end of the motor (XR115 mounting end). Refer to the pinout and phasing tables for exceptions.

NOTE:
Wiring option “G” provides a pinout compatible with Northstar™ encoders, with a cable shield connection on pin 10. Note that this option does not ground the shield.

CORRECTIVE ACTION FOR PHASE REVERSAL

1) Remove Power.
2) Exchange wires on cable, either at encoder cable end, or at speed controller end (but not both).
   a) **Single Ended 2 Phase Wiring** (see wiring diagram) Exchange A with B
   b) **Differential 2 Phase Wiring** (see wiring diagram) Exchange either A with A– in the phase A pair OR B with B– in the phase B pair but NOT both.
3) Apply Power.
4) Verify encoder feedback is correct, using hand rotation of shaft, or jog mode of the speed controller.

Interconnection cables specified in the wire selection chart are based on typical applications. Cable must be selected and installed in accordance with regional standards. Typical interconnection cable is 4 twisted pair + overall shield. Recommended cable is Avtron B37178. Alternates are Belden P/N 1064A or Rockbestos 04P-18 I/S-OS. Actual cables should be picked based on specific application requirements such as abrasion, temperature, tensile strength, solvents, etc. General electrical requirements are: stranded copper, 20 through 16 AWG, twisted wire pairs, braid or foil individual shields or over-all shield with drain wire, .03uF of maximum total mutual or direct capacitance and outer sheath insulator. 20 AWG wire should not be used for DC power to the encoder for runs greater than 200 feet and 22AWG should not be used for runs greater than 100 ft. This is to minimize voltage drop between the encoder and the XRB3 isolator. The smaller conductors are acceptable for the signal lines.

FAULT-CHECK

After power-up and the rotor position is checked by the sensor, the Fault-Check LED will turn green. If the adaptive electronics reach their adjustment limit for any reason, the Fault-Check alarm and LED will notify the drive and operator of an impending failure. The LED will turn red if the Adaptive Electronics reach their adjustment limit. This output occurs before an actual failure, allowing steps to be taken to replace the unit before it causes unscheduled downtime. Fault-Check annunciation is available as an “alarm” output through the connector (zone 2 and division 2 configurations only) and as an integral LED.

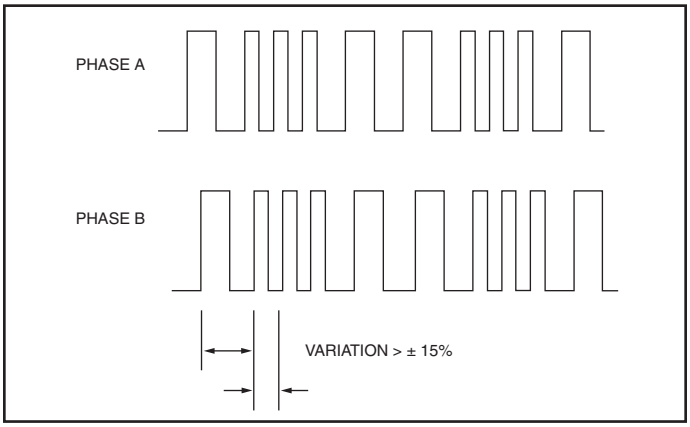
TROUBLESHOOTING

If the drive indicates a loss of encoder/tach fault and the XR115 fault-check LED is not illuminated, check the encoder power supply. If power is present, check polarity; one indicator of reversed power supply is that all outputs will be high at the same time. If the drive indicates encoder fault, but the LED shows GREEN, then check the wiring between the drive and the encoder. If the wiring appears correct and in good shape, test the wiring by replacing the XR115. If the new unit shows GREEN, and the drive still shows encoder loss/tach fault, then the wiring is faulty and should be repaired or replaced.
If the alarm output and/or LED indicate a fault (RED):

1. Remove the rear cover, and use the built-in gauge to check the location of the rotor (see Figure 1). Ensure the label marked “This side out” and/or cam screws is/are facing away from the motor.

2. Remove the XR115 from the motor. Clean the housing mounting surface for the XR115 housing. Ensure the XR115 is directly mounted on the motor, with no sealant, gasketing, or other materials, and is firmly bolted in place.

If the alarm output and/or LED indicate a fault (RED) on a properly mounted XR115 and the rotor is properly located, replace the XR115. An oscilloscope can also be used to verify proper output of the SMARTSafe™ encoder at the encoder connector itself and at the drive/ controller cabinet. If the outputs show large variations in the signals at steady speed (jitter or "accordion effect", see figure below), check rotor position. If the rotor position is correct, the motor or shaft may be highly magnetized. Replace any magnetized material nearby with non-magnetic material (aluminum, stainless) (especially shafts). For GE CD frame motors and similar styles, Avtron offers non-magnetic stub shafts. If variations persist, consider replacing the encoder with super-shielded models, option -005, or use retrofit shielding kits AVSKxxx yy z, where xxx=model (ex: 115A), yy=rotor (ex: CB), and z=cover (ex: F).



NOTE:
Do not use rotors from THIN-LINE I (M56, M56S, M67, M85, M115) with XR115 This will cause incorrect PPR output, but the XR115 LED will remain green.

ENCODER REMOVAL
The XR115 stator housing can be removed by loosening and removing the socket head cap screws.

CAM SCREW ROTOR REMOVAL
Disengage the (2) cam screws by turning them counterclockwise less than 1 full turn. The cam heads will visibly move away from the shaft. Remove the rotor by hand by pulling it away from the motor. If the rotor will not move, do NOT use a gear puller, and do not use a heat gun. Instead, insert two M6 screws, >25mm length into the Jack Screw Holes shown in Fig 2. Alternately tighten the screws to push the rotor away from the motor and remove it.

LARGE BORE SET SCREW ROTOR REMOVAL
Disengage the (2) set screws by turning them counterclockwise until removed from the rotor. Retain the set screws. Remove the rotor by hand by pulling it away from the motor. If the rotor will not move, do NOT use a gear puller, and do not use a heat gun. Instead, pry the rotor away from the motor gently, being careful to only pry against the rotor metal hub and not the magnetic outer strip.

Equipment Needed for Installation

Provided	Optional	Not Provided
XR115 Stator/Housing	Extended Shaft Cover w/ Screws 6-32 x 0.31" (4)	Phillips Screwdriver
Socket Hd Cap Screw M10 x 20mm (4)	Lock Washers	2mm Hex Wrench (Set Screw Style Rotors)
XR115 Rotor	Thru Shaft Cover w/ V-Ring Seal and Silicone Lubricant	3mm Hex Wrench
Socket Set Screw M4 x 6mm (2) or Preinstalled cam screw		8mm Hex Wrench
Thread locker (blue)		
Model XRB3 Isolator for Division 1, Zone 0, 1, 20 and 21 applications (Sold Separately)		

XR115 PART NUMBERS AND AVAILABLE OPTIONS

		Style / Size						
Model	**Housing Type**	**Rotor Code** (See Chart)	**Cover Style**	**Line Driver**	**Single/Left Output (PPR)**	**Right Output (PPR)**	**Connector**	**Modifications**
XR115	**1-** Single Output **2-** Dual Output * Set Screw Rotor only	**C0-** Non. Std. Shaft Size **XX-** None **Thru Shaft Rotor (Metric)** **D2-** 10mm **DK-** 38mm **DA-** 11mm **DL-** 42mm **D3-** 12mm **DM-** 45mm **DB-** 14mm **DN-** 48mm **DC-** 15mm **DP-** 52mm **DD-** 16mm **DR-** 55mm **D4-** 18mm **DS-** 60mm **DE-** 19mm **MU-** 65mm* **DF-** 24mm **MV-** 70mm* **DG-** 28mm **MW-** 75mm* **DH-** 30mm **MY-** 80mm* **DT-** 32mm **MZ-** 85mm* **DJ-** 36mm	**E-** Extended Shaft Cover **F-** Flat Cover **T-** Flat Thru-Hole Cover with Shaft Seal (Seal not available on shafts larger than 75mm)	**See Line Driver / Connector Options Chart**	**0-** Non-std. **V-** 900 **F-** 60 **J-** 960 **G-** 100 **Y-** 1024 **H-** 120 **Z-** 1200 **A-** 128 **3-** 2000 **L-** 240 **4-** 2048 **N-** 256 **5-** 2500 **P-** 300 **D-** 4096 **E-** 360 **8-** 4800 **B-** 480 **9-** 5000 **Q-** 500 **R-** 512 **S-** 600	**0-** Non-std. **V-** 900 **F-** 60 **J-** 960 **G-** 100 **Y-** 1024 **H-** 120 **Z-** 1200 **A-** 128 **3-** 2000 **L-** 240 **4-** 2048 **N-** 256 **5-** 2500 **P-** 300 **D-** 4096 **E-** 360 **8-** 4800 **B-** 480 **9-** 5000 **Q-** 500 **X-** None **R-** 512 **S-** 600	**See Line Driver / Connector Options Chart**	**000-** No Modification **004-** Add Housing Drain **005-** Super Magnetic Shielding **018-** Add Isolator **4xx-** Special PPR (see chart) **9xx-** Special Cable Length, xx=length * 0.3m

SPECIAL PPR OPTION CODES		
OPTION CODE	**LEFT PPR**	**RIGHT PPR**
401	1270	None
402	150	None
403	50	None
404	512	16
405	16	None
406	6000	None

	Rotor Codes for Metric Shaft Sizes					
	Cam Screw Style		Set Screw Style		Single Cam Keyed	
	Rotor Code		Rotor Code		Rotor Code	
Size mm	Style	Size	Style	Size	Style	Size
NONE	**Y**	**X**	**Y**	**X**	**Y**	**X**
10.0	**D**	**2**	**M**	**2**	**J**	N/A
11.0	**D**	**A**	**M**	**A**	**J**	N/A
12.0	**D**	**3**	**M**	**3**	**J**	N/A
14.0	**D**	**B**	**M**	**B**	**J**	N/A
15.0	**D**	**C**	**M**	**C**	**J**	N/A
16.0	**D**	**D**	**M**	**D**	**J**	N/A
18.0	**D**	**4**	**M**	**4**	**J**	N/A
19.0	**D**	**E**	**M**	**E**	**J**	N/A
24.0	**D**	**F**	**M**	**F**	**J**	N/A
25.0	**D**	**5**	**M**	**5**	**J**	N/A
28.0	**D**	**G**	**M**	**G**	**J**	N/A
30.0	**D**	**H**	**M**	**H**	**J**	N/A
32.0	**D**	**T**	**M**	**T**	**J**	N/A
36.0	**D**	**J**	**M**	**J**	**J**	N/A
38.0	**D**	**K**	**M**	**K**	**J**	N/A
42.0	**D**	**L**	**M**	**L**	**J**	N/A
45.0	**D**	**M**	**M**	**M**	**J**	N/A
48.0	**D**	**N**	**M**	**N**	**J**	N/A
52.0	**D**	**P**	**M**	**P**	**J**	N/A
55.0	**D**	**R**	**M**	**R**	**J**	N/A
60.0	**D**	**S**	**M**	**S**	**J**	N/A
65.0	**D**	N/A	**M**	**U**	**J**	N/A
70.0	**D**	N/A	**M**	**V**	**J**	N/A
75.0	**D**	N/A	**M**	**W**	**J**	N/A
80.0	**D**	N/A	**M**	**Y**	**J**	N/A
85.0	**D**	N/A	**M**	**Z**	**J**	N/A

			Line Driver Options				
		Description	ATEX / IECEx Zone 1 & 21	ATEX / IECEx Zone 2 & 22	Class I Div. 1 & Zone 0	Class I Div. 2 Listed	Class I Div. 2 Recognized
		Voltage In / Out	5-7 / 5	5-24 / 5-24	5-7 / 5	5-24 / 5-24	5-24 / 5-24
		Line Driver Code	**H**	**7**	**F**	**G**	**R**
	Code	Required Isolator	XRB3	None	XRB3	None	None
Thinline Connector Options	**A**	10 Pin MS W/O Plug Std Phasing	✓	✓	✓		✓
	B	10 Pin MS W/O Plug Dynapar Phasing	✓	✓	✓		✓
	C	10 Pin MS W/Plug Std Phasing	✓	✓	✓		✓
	D	10 Pin MS W/Plug Dynapar Phasing	✓	✓	✓		✓
	E	7 Pin MS W/Plug A-quad-B Std. Phasing	✓	✓	✓		✓
	F	7 Pin MS W/Plug A, A\ Std. Phasing	✓	✓	✓		✓
	J	7 Pin MS W/Plug A, B, Z Std. Phasing	✓	✓	✓		✓
	K	7 Pin MS W/Plug A, A\, B,B\ Std. Phasing	✓	✓	✓		✓
	S	7 Pin MS W/Plug A-quad-B Dyn. Phasing	✓	✓	✓		✓
	T	7 Pin MS W/Plug A, A\ Dyn. Phasing	✓	✓	✓		✓
	U	7 Pin MS W/Plug A, B, Z Dyn. Phasing	✓	✓	✓		✓
	V	7 Pin MS W/Plug A, A\, B,B\ Dyn. Phasing	✓	✓	✓		✓
	P	Small Industrial Style Std. Pinout & Plug	✓	✓	✓		
	G	Small Industrial Style Northstar Pinout & Plug	✓	✓	✓		
	R	10 Pin mini Twist Lock with Plug	✓	✓	✓		
	W	Flexible Cable with Sealing Gland	✓	✓	✓		
	Y	10 Pin MS with Plug on 12" cable	✓	✓	✓		
	H	Conduit Box, Terminal Block & 1/2" NPT	✓	✓	✓	✓	
	M	Conduit Box, Terminal Block, 3/4" NPT	✓	✓	✓	✓	
	N	Conduit Box, Terminal Block & 1" NPT	✓	✓	✓	✓	
	8	Conduit Box, Terminal Block & 25mm	✓	✓	✓	✓	

SPECIFICATIONS

ELECTRICAL

A. Operating Power (Vin)
1. Volts ..... See Line Driver Option Chart
2. Current ..... Each output, 100mA Nom. 355mA Max.
B. Output Format
1. 2/ & Comp ..... A, $\overline{A}$, B, $\overline{B}$ (differential line driver)
2. Marker ..... 1/Rev, Z, $\overline{Z}$
C. Signal Type ..... Incremental, Square Wave, 50 ±10% Duty Cycle.
D. Direction Sensing ..... Typically A leads.
Refer to the connector pinout and phasing table for exceptions B for CW rotation as viewed from the back of the tach looking at the non-drive end of the motor.
E. Phase Sep ..... 15% minimum
F. Frequency Range ..... 0 to 165,000 Hz
G. PPR 8-5000
H. Line Driver Specs ..... See table
I. Connectors ..... See connector options on page 1
J. Integral LED Indicator ..... GREEN: power on, unit ok. RED: alarm on

MECHANICAL

A. Rotor Inertia ..... 0.17-0.36 Oz. In. Sec.2
B. Acceleration ..... 5000 RPM/Sec. Max.
C. Speed ..... 5400 RPM Max.
D. Weight ..... 2-3 lbs [0.9kg to 1.36kg].
E. Sensor to Rotor
Air Gap (nominal) ..... 0.023" [0.58mm]
Tolerance ..... ±0.015" [0.38mm]
F. Rotor Axial Tolerance ..... ±0.050" [±1.27mm]

ENVIRONMENTAL

Solid cast aluminum stator and rotor. Less than 7.5% in total magnesium, titanium and zirconium. Fully potted electronics, protected against oil and water spray. Operating Temperature: -40 to 80°C, 0-100% condensing humidity. See "Description" section for information on hazardous location environments.

XR115 Connector Spare Parts					
Style	Code	Encoder Side		Customer Side	
Small Industrial "Epic"	P, G	315934	Base	315937	Hood
		315935	Terminals	315936	Terminals
				401122	1/2 NPT
10 pin MS	A, B, C, D	Box Recepticle		Plug	
		315933	Standard	315932	Standard
		431079	Line Driver "R"	316445	Line Driver "R"
				411216	Bushing
				411217	Bushing
				411218	Bushing
				411219	Bushing
7 Pin MS	E, F, J, K, S, T, U, V	Box Recepticle		Plug	
		316297	Standard	315932	Standard
		431080	Line Driver "R"	316446	Line Driver "R"
				411218	Bushing
				411219	Bushing
Conduit Box	H,M,N,8			364987	Terminal Plug
10 pin mini MS Twist Lock	R	431081	Base	316447	Plug
		471748	Gasket		
10 pin MS on cable	Y	314383	In-Line	316445	Plug
				411216	Bushing
				411217	Bushing
				411218	Bushing
				411219	Bushing

			Line Driver Specifications				Isolator Specifications	
		Code	H	7	F	G	XRB3	
Description		Symbol	ATEX / IECEx Zone 1 & 21(ia)	ATEX / IECEx Zone 2 & 22	Class I Div. 1 & Zone 0	Class I Div. 2 Listed	ATEX/IECEx Zone 1&21(ia) + Class I Div 1&Zone 0	Units
Line Driver			7272	7272	7272	7272	IXDF604	
Input Voltage (Nominal)		V_{IN} / V_S	5-7	5-24	5-7	5-24	12-24	V_{DC}
Input Voltage (Max Safe)		U_M	N/A	N/A	N/A	N/A	30	V
Input Current (no load)		I_{IN} / I_S	80	80	80	80	150	mA
Input Current (Typical)		I_{IN} / I_S	100	200	100	200	450	mA
Input Current (Max.)		I_{IN} / I_S	140	300	140	300	900	mA
Output Voltage (nominal)		V_H	N/A	N/A	N/A	N/A	6.8	V_{DC}
Output Voltage Min.(@140mA)		V_H	N/A	N/A	N/A	N/A	5	V_{DC}
Output Voltabe Max(No Load)		V_H	N/A	N/A	N/A	N/A	7.14	V_{DC}
Output Current (@6.8V)		I_H	N/A	N/A	N/A	N/A	115	mA
Output Current (@5V)		I_H	N/A	N/A	N/A	N/A	140	mA
Output Current (short circuit)		I_H	N/A	N/A	N/A	N/A	420	mA
Voltage Output High (Nominal)		V_{OH}	5	V_{IN}-1	5	V_{IN}-1	V_S-1	V_{DC}
Voltage Output Low (Nominal)		V_{OL}	.5	.5	.5	.5	.4	V_{DC}
Signal Current (Continuous)		I_{OH} / I_{OL}	100	100	100	100	2580	mA
Signal Current (Peak)		I_{OH} / I_{OL}	1500	1500	1500	1500	3000	mA
Output Resistance Ω		R_{OH} / R_{OL}	15	15	15	15	7	Ω
Cable Drive			500	5-15Vin=500 24Vin = 250	500	5-15Vin=500 24Vin = 250	1000	ft.
Protection	Reverse Voltage		Yes	Yes	Yes	Yes	Yes	
	Short Circuit		Best	Good	Best	Good	Best	
	Transient		Good	Good	Good	Good	Best	
Alarm	+Vout		no	Yes	no	Yes	no	
	Alarm		no	Yes	no	Yes	no	
	LED		Yes	Yes	Yes	Yes	Yes	
	+Vout		Reverence Signal for Alarm Circuit, Output Voltage = Input Voltage					
	Alarm		Open Collector, normally off, goes low on alarm, sink 100mA max, See Connector Pinouts for Availability					
	LED		Green = Power On, Red = Alarm					

Thinline II Spare Parts (AV56/AV56S/AV67/AV85/AV115/XR56/XR56S/XR67/XR85/XR115 Only) SAE/USA Sizes					
Shaft Size	Rotors AV56A, AV67, AV85, AV115 , XR56A, XR67, XR85, XR115		Rotor AV56S , XR56S	Thru-Shaft Covers	
	Option Code	Cam Screw	Set Screw Stainless Rotor	AV56, AV56S, AV67, AV115 , XR56, XR56S, XR67, XR115 Cover Kit	AV85/XR85 Cover/kit
.500/.4995	CA	AVTR1-CA	AVTR2-TA	A36521-TA	A36523-TA
.625/.6245	CB	AVTR1-CB	AVTR2-TB	A36521-TB	A36523-TB
.875/.8745	CC	AVTR1-CC	AVTR2-TC	A36521-TC	A36523-TC
.9375/.9370	CD	AVTR1-CD	AVTR2-TD	A36521-TD	A36523-TD
1.000/.9995	CE	AVTR1-CE	AVTR2-TE	A36521-TE	A36523-TE
1.125/1.1245	CF	AVTR1-CF	AVTR2-TF	A36521-TF	A36523-TF
1.250/1.2495	CG	AVTR1-CG	AVTR2-TG	A36521-TG	A36523-TG
1.375/1.3745	CH	AVTR1-CH	AVTR2-TH	A36521-TH	A36523-TH
1.500/1.4995	CT	AVTR1-CT	AVTR2-TT	A36521-TT	A36523-TT
1.625/1.6245	CJ	AVTR1-CJ	AVTR2-TJ	A36521-TJ	A36523-TJ
1.750/1.7495	CK	AVTR1-CK	AVTR2-TK	A36521-TK	A36523-TK
1.875/1.8745	CL	AVTR1-CL	AVTR2-TL	A36521-TL	A36523-TL
2.000/1.9995	CM	AVTR1-CM	AVTR2-TM	A36521-TM	A36523-TM
2.125/2.1245	CN	AVTR1-CN	AVTR2-TN	A36521-TN	A36523-TN
2.250/2.2495	CQ	AVTR1-CQ	AVTR2-TQ	A36521-TQ	A36523-TQ
2.375/2.3745	CP	AVTR1-CP	AVTR2-TP	A36521-TP	A36523-TP
2.500/2.4995	CR	AVTR1-CR	AVTR2-TR	A36521-TR	A36523-TR
2.625/2.6245	TS	N/A	AVTR2-TS	A36521-TS	A36523-TS
2.875/2.8745	TU	N/A	AVTR2-TU	A36521-TU	A36523-TU
3.000/2.9995	TV	N/A	AVTR2-TV	A36521-TV	A36523-TV
3.1250/3.1245	T4	N/A	AVTR2-T4	A36737-T4	A36523-T4
3.1875/3.1870	T7	N/A	AVTR2-T7	A36737-T7	A36523-T7

1.125" w/.25" Keyway	AVTR-KD
15/16" w/.25" Keyway	AVTR-KF

Extended and Flat Cover Plates			
Shaft Size	Model	Extended Shaft Cover Kit	Flat Cover Kit
Any	AV56A, AV67, AV115 , XR56A, XR67, XR115	A35841	A37298
Any	AV56S , XR56S	A36526	A37298
Any	AV85 , XR85	A35841	A36525

Thinline II Spare Parts (AV56/AV56S/AV67/AV85/AV115/XR56/XR56S/XR67/XR85/XR115 Only) Metric Sizes					
Shaft Size	Rotors AV56A, AV67, AV85, AV115 , XR56A, XR67, XR85, XR115			Thru-Shaft Covers	
	Option Code	Cam Screw	Set Screw	AV56, AV56S, AV67, AV115 , XR56, XR56S, XR67, XR115 Cover Kit	AV85 /XR85 Cover /kit
10mm	D2	AVTR1-D2	N/A	A36522-M2	A36524-M2
11mm	DA	AVTR1-DA	N/A	A36522-MA	A36524-MA
12mm	D3	AVTR1-D3	N/A	A36522-M3	A36524-M3
14mm	DB	AVTR1-DB	N/A	A36522-MB	A36524-MB
15mm	DC	AVTR1-DC	N/A	A36522-MC	A36524-MC
16mm	DD	AVTR1-DD	N/A	A36522-MD	A36524-MD
18mm	D4	AVTR1-D4	N/A	A36522-M4	A36524-M4
19mm	DE	AVTR1-DE	N/A	A36522-ME	A36524-ME
24mm	DF	AVTR1-DF	N/A	A36522-MF	A36524-MF
28mm	DG	AVTR1-DG	N/A	A36522-MG	A36524-MG
30mm	DH	AVTR1-DH	N/A	A36522-MH	A36524-MH
32mm	DT	AVTR1-DT	N/A	A36522-MT	A36524-MT
36mm	DJ	AVTR1-DJ	N/A	A36522-MJ	A36524-MJ
38mm	DK	AVTR1-DK	N/A	A36522-MK	A36524-MK
42mm	DL	AVTR1-DL	N/A	A36522-ML	A36524-ML
45mm	DM	AVTR1-DM	N/A	A36522-MM	A36524-MM
48mm	DN	AVTR1-DN	N/A	A36522-MN	A36524-MN
52mm	DP	AVTR1-DP	N/A	A36522-MP	A36524-MP
55mm	DR	AVTR1-DR	N/A	A36522-MR	A36524-MR
60mm	DS	AVTR1-DS	N/A	A36522-MS	A36524-MS
65mm	MU	N/A	AVTR1-MU	A36522-MU	A36524-MU
70mm	MV	N/A	AVTR1-MV	A36522-MV	A36524-MV
75mm	MW	N/A	AVTR1-MW	A36522-MW	A36524-MW
80mm	MY	N/A	AVTR1-MY	A36737-MY	A36524-MY
85mm	MZ	N/A	AVTR1-MZ	A36737-MZ	A36524-MZ

FIGURE 1

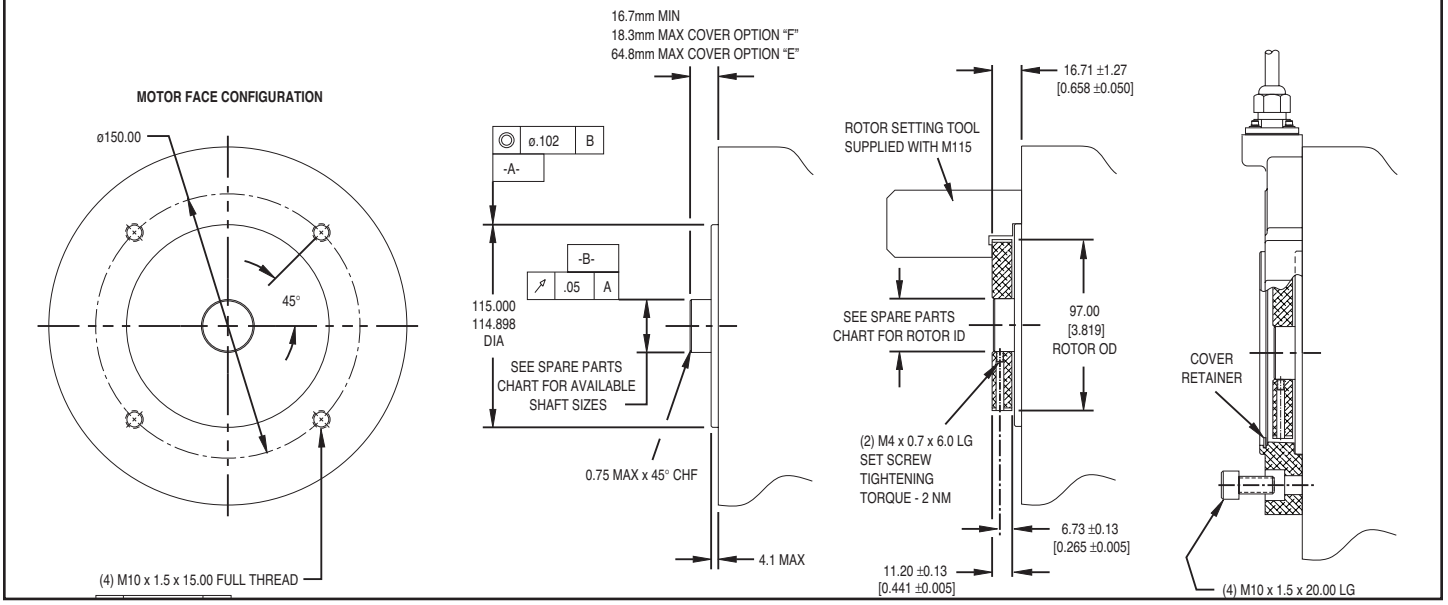
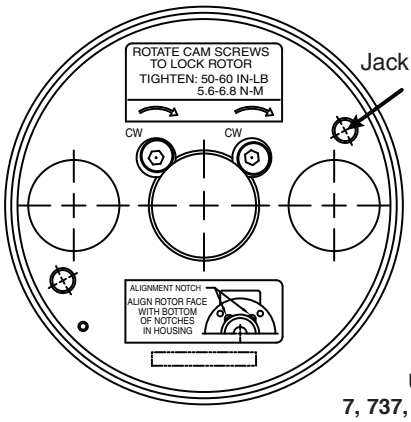
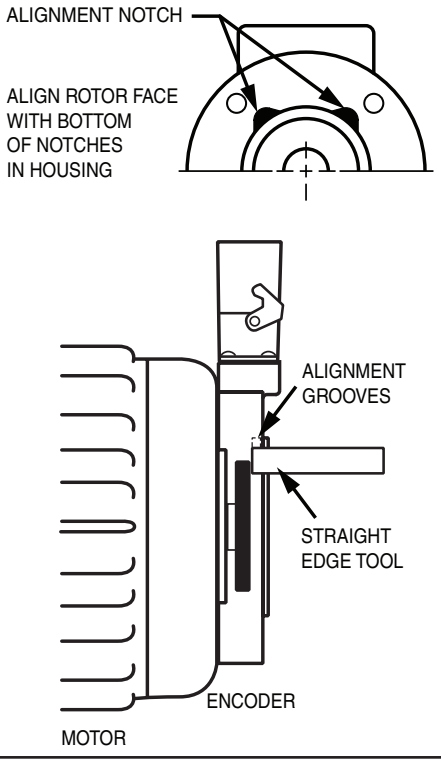


FIGURE 2



U.S. Patent
7, 737, 601 & 7, 485, 997

FIGURE 3



See the following Installation Drawings for Wiring Information

D53008: ATEX / IECEx Zone 1 & 21

D52353: ATEX / IECEx Zone 2 & 22

D52354: Division 1

D52355: Division 2

NOTE: Remote alarm is not functional for Division 1, Zone 0 or Zone 1

Pinouts for Connector Options

Connection Option Code	Description	Phasing	Signal	0V Gnd	A+	B+	Z+	* Alm+	+Vin	$\overline{\text{A-}}$	$\overline{\text{B-}}$	$\overline{\text{Z-}}$	* Alm
Y	10 Pin MS Avtron / Northstar Pinout	CW	Pin #	A	D	E	C	NC	B	G	H	I	NC
A,C	10 Pin MS Small Encoder Std Pinout	CW	Pin #	F	A	B	C	NC	D	H	I	J	NC
B,D	10 Pin MS Small Encoder Dynapar Pinout	CCW	Pin #	F	A	B	C	NC	D	H	I	J	NC
R	10 Pin MS Mini Twist Lock	CW	Pin #	F	A	B	C	NC	D	H	J	K	NC
P	10 Pin, Mini Industrial, Avtron Pinout	CW	Pin #	1	2	3	4	5	6	7	8	9	10
G	10 Pin, Mini Industrial, Northstar Pinout	CW	Pin #	1	2	3	4	NC	6	7	8	9	NC
H,M,N,8	Conduit Box W/10 Pin Terminal Block	CW	Pin #	1	2	3	4	5	6	7	8	9	10
W	10 Conductor Wire Cable	CW	Color	BLK	GRN	BLU	ORG	BRN	RED	YEL	GRA	WHT	VIO

Connection Option Code	Description	Phasing	Signal	0V Gnd	A+	B+	Z+	+Vin	$\overline{\text{A-}}$	$\overline{\text{B-}}$	$\overline{\text{Z-}}$
K	7 Pin MS, Avtron / BEI Pinout (A,A\,B,B\)	CW	Pin #	F	A	B	NC	D	C	E	NC
F	7 Pin MS, Avtron / BEI Pinout (A,A\)	CW	Pin #	F	A	NC	NC	D	C	NC	NC
J	7 Pin MS, Avtron / BEI Pinout (A,B,Z)	CW	Pin #	F	A	B	C	D	NC	NC	NC
E	7 Pin MS, Avtron / BEI Pinout (A,B)	CW	Pin #	F	A	B	NC	D	NC	NC	NC
V	7 Pin MS, Dynapar Pinout (A,A\,B,B\)	CCW	Pin #	F	A	B	NC	D	C	E	NC
T	7 Pin MS, Dynapar HS35 Pinout (A,A\)	CCW	Pin #	F	A	NC	NC	D	C	NC	NC
U	7 Pin MS, Dynapar HS35 Pinout (A,B,Z)	CCW	Pin #	F	A	B	C	D	NC	NC	NC
S	7 Pin MS, Dynapar HS35 Pinout (A,B)	CCW	Pin #	F	A	B	NC	D	NC	NC	NC

Phasing is defined as the direction of rotation for which phase A leads B as viewed from the back of the Encoder

***** Remote alarm function not available with line driver options “H”, “7” or “F”
(Zone 0, Zone 1 or Class I Div I)

THIN-LINE II™

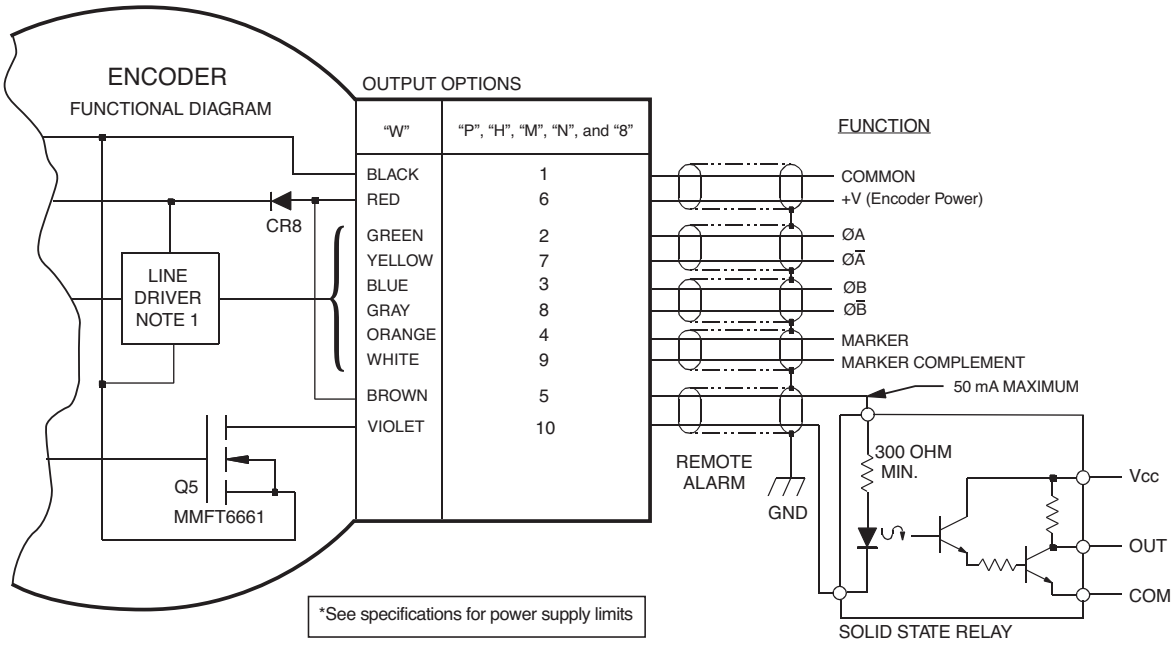
Application Examples

Applies to XR115 Zone 2 & Division 2 models, with wiring options “W”, “P”, “H”, “M”,“N”, and “8”.
Remote alarm not available for Zone I & Div I

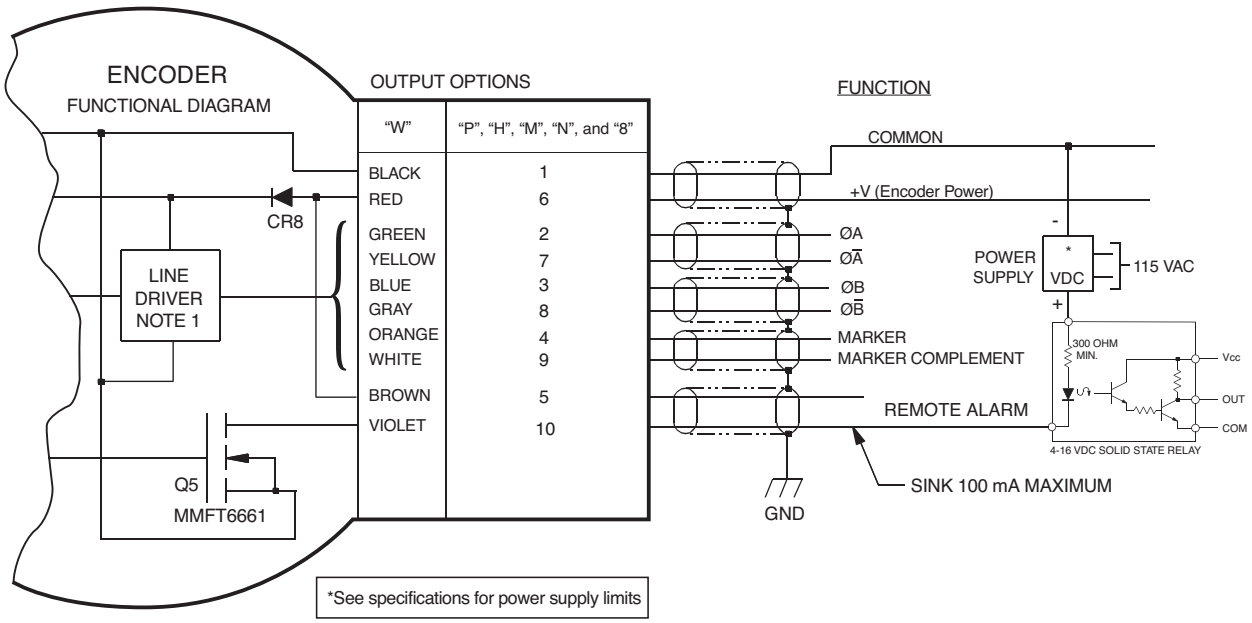
ALARM OUTPUT CONNECTION

Avtron THIN-LINE II encoders provide an alarm signal if maintenance is required under specific circumstances. An alarm LED indicator is also available. Green indicates power on, red indicates alarm on. Following are application examples provided to help install the alarm output.

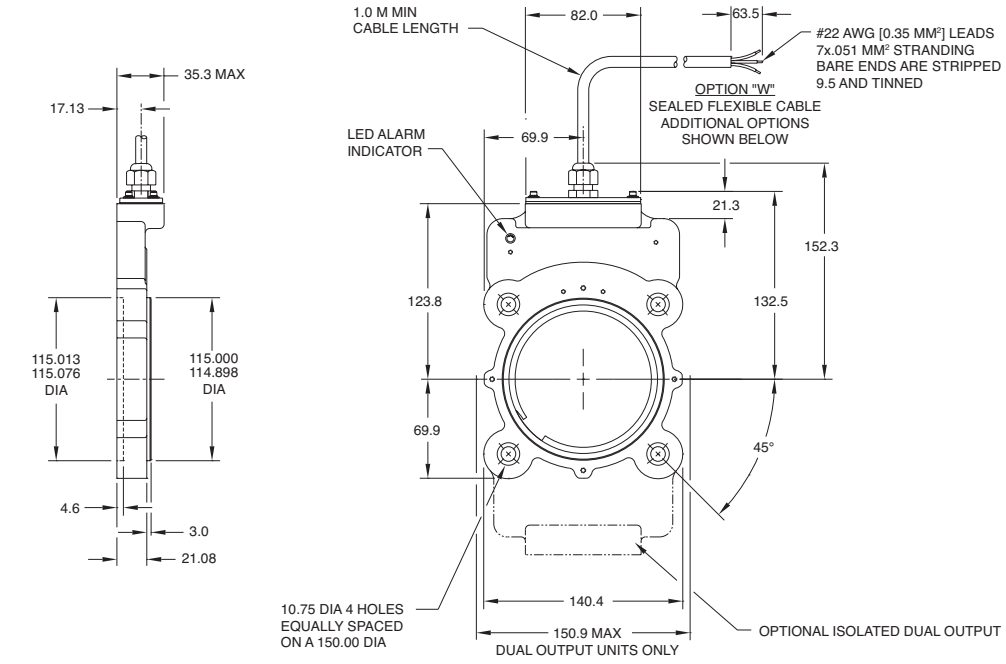
Example 1. Alarm output using +V(OUT). +V(OUT) is equal to +V, the encoder power supply.

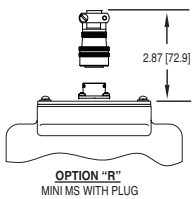


Example 2. Alarm output using seperate *VDC power supply and relay.

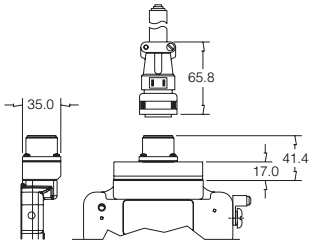


OUTLINE DRAWING

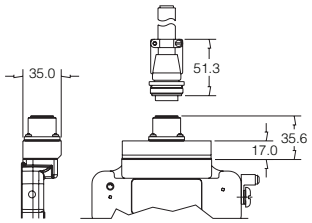




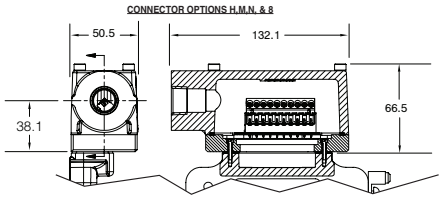
OPTION "R"
MINI MS WITH PLUG

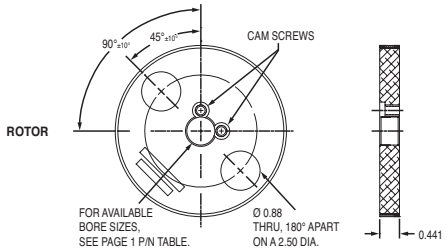


OPTIONS "A & B" – 10 PIN BULKHEAD CONNECTOR ONLY
OPTIONS "C & D" – WITH MATING PLUG (SHOWN)

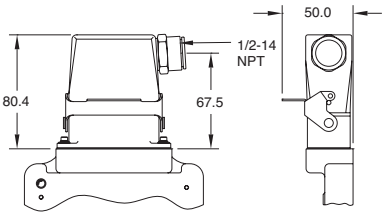


OPTIONS "E, F, J & K" – 7 PIN MS WITH MATING PLUG (STANDARD PHASING)
OPTIONS "S, T, U & V" – 7 PIN MS WITH MATING PLUG (DYNAPAR PHASING)

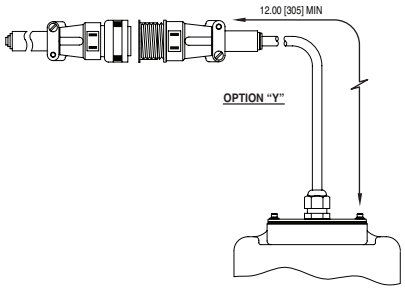




CAM SCREW ROTOR



OPTIONS "P" & "G"
PLUG-IN INDUSTRIAL
CONNECTOR



4 – STANDARD FLAT COVER SHOWN IN FRONT VIEW.
OPTIONAL THRU-SHAFT COVER NOT SHOWN
3 – DIMENSIONS IN MILLIMETERS
2 – ALL DIMENSIONS ARE APPROXIMATE
1 – WEIGHT: 0.9 TO 1.36 KG.

CE

Features and specifications subject to change without notice.
Avtron standard warranty applies. All dimensions are in millimeters approx.

These instructions have been reviewed and the product evaluated as suitable for our application.

Company Name _____

Authorized Company Representative _____

Title _____ Date _____

Nidec Industrial Solutions | 243 Tuxedo Avenue | Cleveland, Ohio 44131 | encoderhelpdesk@nidec-industrial.com
+1 216-642-1230 | **www.avtronencoders.com**

LINE DRIVER OPTION CODE FOR: XR850, XR125, XR485, XR685 (5 = ib, H = ia)

XRYYY XXXX5XXX XXX

- CONNECTOR OPTION CODE LOCATION FOR: XR56A, XR56S XR67A, XR85A, XR115, XR850, XR125, XR485, XR685
- CONNECTOR OPTION CODE LOCATION FOR: XR45, XR47, XR4F
- LINE DRIVER OPTION CODE LOCATION FOR: XR56A, XR56S XR67A, XR85A, XR115, XR45, XR47, XR4F, (5 = ib, H = ia)
- MODEL # CODES: 56A, 56S, 67A, 85A, 115, 45, 47, 4F, 850, 125, 485, 685
- HAZARDOUS LOCATION CODE

CONNECTOR OPTION CODES = A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, S, T, U, V, W, Y, Z, 2, 3, 4, 5, 6, 7, 8
LINE DRIVER OPTION CODE = H FOR ZONE I & 21 (ia) 5 FOR ZONE 1 & 21 (ib)

XRYY 5 X X XXX

- CONNECTOR OPTION CODE LOCATION FOR: XR5, XR12, XR97
- LINE DRIVER OPTION CODE LOCATION FOR: XR5, XR12, XR97
- MODEL # CODES: 5, 12, 97
- HAZARDOUS LOCATION CODE

CONNECTOR OPTION CODES = A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, S, T, U, V, W, Y, Z, 2, 3, 4, 5, 6, 7, 8
LINE DRIVER OPTION CODE = H FOR ZONE I & 21 (ia) 5 FOR ZONE 1 & 21 (ib)
ALL OTHER CODE LOCATIONS ARE NOT RELEVANT TO INTRINSIC SAFETY. SEE INSTRUCTION SHEETS FOR DEFINITIONS

THE XR____ FAMILY OF ENCODERS HAS BEEN EVALUATED TO BE COMPLIANT WITH:

IEC60079-0:2011
EN60079-0:2012/A11:2013
IEC60079-11:2011
EN60079-11:2012
BSEN61000-6-4:2007 AND BSEN61000-6-2:2005
CERTIFICATES OF CONFORMITY ExVeritas 20ATEX0676X, IECEx EXV 20.0029X

THE XR____ FAMILY OF ENCODERS IS CERTIFIED FOR USE IN:

GROUP II, CATEGORY 2 (ZONE 1) GAS GROUP IIC WHEN MARKED CE 0539 ⟨Ex⟩ II 2 GD Ex ia IIC T4 Gb AND USED WITH AN ISOLATOR XRB3 MARKED CE 0539 ⟨Ex⟩ II (2) GD [Ex ia IIC Gb]

GROUP II, CATEGORY 2 (ZONE 21) DUST GROUP IIIC WHEN MARKED CE 0539 ⟨Ex⟩ II 2 GD Ex ia IIIC T200°C Db AND USED WITH AN ISOLATOR XRB3 MARKED CE 0539 ⟨Ex⟩ II (2) GD [Ex ia IIIC Db]

GROUP II, CATEGORY 2 (ZONE 1) GAS GROUP IIC WHEN MARKED CE 0539 ⟨Ex⟩ II 2 GD Ex ib IIC T4 Gb AND USED WITH AN ISOLATOR XRB3 MARKED CE 0539 ⟨Ex⟩ II (2) GD [Ex ia IIC Gb]

GROUP II, CATEGORY 2 (ZONE 21) DUST GROUP IIIC WHEN MARKED CE 0539 ⟨Ex⟩ II 2 GD Ex ib IIIC T200°C Db AND USED WITH AN ISOLATOR XRB3 MARKED CE 0539 ⟨Ex⟩ II (2) GD [Ex ia IIIC Db]

MAXIMUM SAFE AREA VOLTAGE = 30V, $-40°C \leq Tamb \leq +80°C$

WARNING: INSTALLATION SHOULD BE PERFORMED ONLY BY QUALIFIED PERSONNEL. SAFETY PRECAUTIONS MUST BE TAKEN TO ENSURE MACHINERY CANNOT ROTATE AND ALL SOURCES OF POWER ARE REMOVED DURING INSTALLATION. EQUIPMENT AVAILABLE AS A SYSTEM ONLY INCLUDING: XR___ ENCODER WITH LINE DRIVER OPTION "H" OR "5" AND AN AVTRON ISOLATOR MODULE AS LISTED ABOVE. THE ISOLATOR IS SUPPLIED AS A SEPARATE MODULE FOR LOCATION IN A SAFE AREA AND MUST BE INSTALLED IN AN ENCLOSURE.

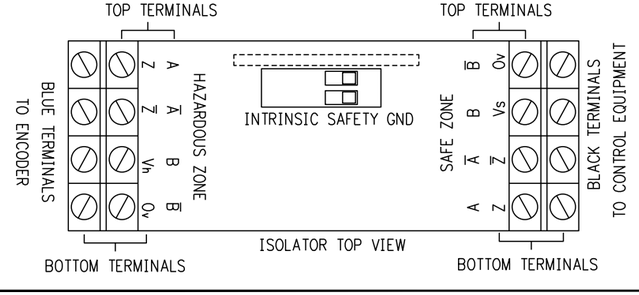
SYSTEM PARAMETERS ARE:

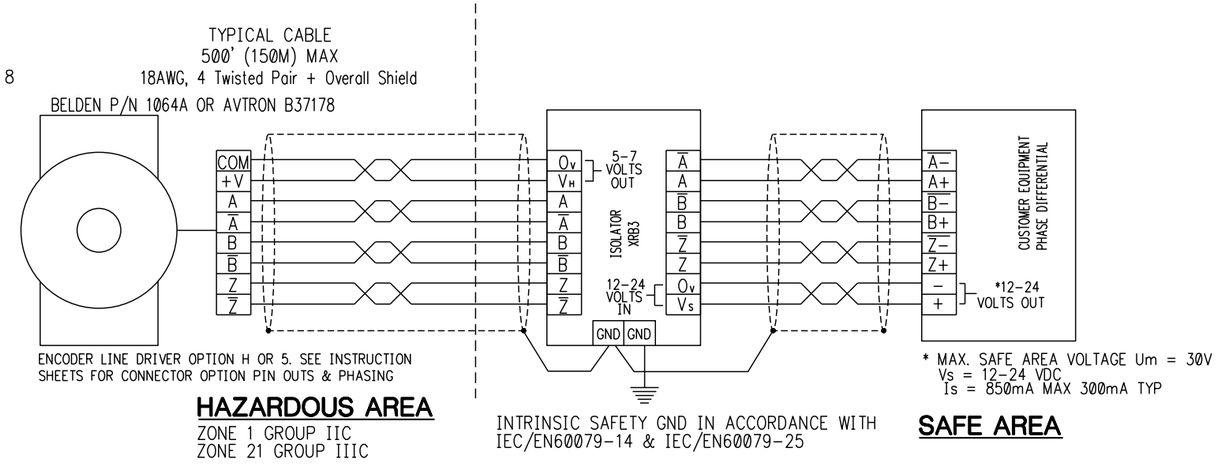
Um (MAXIMUM SAFE AREA VOLTAGE) = 30V
Uo (OPEN CIRCUIT VOLTAGE) = 7.14 VDC
Io (SHORT CIRCUIT CURRENT) = 420 mA
Co (SYSTEM CAPACITANCE) = 13.5 uF MAX.
Lo (SYSTEM INDUCTANCE) = .15 mH MAX.

THIS DRAWING IDENTIFIES CHARACTERISTICS REQUIRED FOR EQUIPMENT USED IN HAZARDOUS LOCATIONS AND MAY NOT BE CHANGED WITHOUT THIRD PARTY APPROVAL. THIRD PARTIES MUST BE IDENTIFIED FROM EQUIPMENT ID LABELS

PARAMETER	ISOLATOR	ENCODER
Um	30V	-
Ui	-	7.14V
Ii	-	420mA
Pi	-	1.4W
Ci	-	11.9uF
Li	-	0mH
Uo	7.14V	-
Io	420mA	-
Po	1.4W	-
Lo	.15mH	
Co	13.5uF	
Lo/Ro	-	
ZONE 1 TABLE OF ENTITY PARAMETERS		

UNLESS OTHERWISE SPECIFIED THE ABOVE NOTES APPLY





CABLE CHARACTERISTICS AND INSTALLATION IN ACCORDANCE WITH THE LATEST EDITION OF IEC/EN60079-14/IEC/EC60079-25.

THE XR___ ENCODERS ARE NOT CONSIDERED AS SAFETY DEVICES AND ARE NOT SUITABLE FOR CONNECTION INTO A SAFETY SYSTEM.
THE XR___ ENCODER CONSTRUCTION MATERIALS CONTAIN NO MORE THAN 7.5% IN TOTAL BY MASS OF MAGNESIUM, TITANIUM AND ZIRCONIUM.
THE CONSTRUCTION MATERIALS ARE NOT CONSIDERED AS ABLE TO TRIGGER AN EXPLOSION IN NORMAL OPERATING MODES. THESE MATERIALS ARE KNOWN TO REACT WITH EXPLOSIVE ATMOSPHERES TO WHICH THE ENCODERS MAY BE SUBJECT. THE CONSTRUCTION MATERIALS DO INCLUDE ALUMINUM. AS SUCH, CARE SHOULD BE TAKEN TO AVOID THE POSSIBILITY OF IGNITION FROM IMPACT OR FRICTION. IT IS THE RESPONSIBILITY OF THE END USER TO ENSURE THAT THE ENCODER IS SELECTED CORRECTLY FOR THE POTENTIALLY EXPLOSIVE ATMOSPHERE IN WHICH THE EQUIPMENT IS TO BE PUT IN SERVICE.

SPECIAL CONDITIONS FOR SAFE USE:

ENCODER:

1. WHEN ENCODER IS MARKED AS "ia Gb" OR "ib Gb" IT MUST ONLY BE USED WITH THE CORRESPONDING ISOLATORS LISTED IN THIS CERTIFICATE. THE ISOLATORS, ENCODERS AND CABLE MUST BE SELECTED AND INSTALLED IN ACCORDANCE WITH IEC/EN 60079-14 AND IEC/EN 60079-25.
2. WHEN THE ENCODER IS MARKED AS "ic" THE POWER SUPPLY SITUATED IN THE SAFE AREA MUST BE LIMITED TO THE LEVELS LISTED ON THIS CERTIFICATE AND CABLE MUST BE SELECTED AND INSTALLED IN ACCORDANCE WITH IEC/EN 60079-14 AND IEC/EN 60079-25
3. THE EQUIPMENT SHOULD BE MOUNTED SO AS TO AVOID ELECTROSTATIC CHARGING.

ISOLATORS: MUST BE INSTALLED INSIDE OF AN ENCLOSURE WITH AN APPROPRIATE MECHANICAL STRENGTH AND MINIMUM DEGREE OF PROTECTION, IP20 FOR INDOOR LOCATIONS AND IP54 FOR OUTDOOR LOCATIONS OR INDOOR WET LOCATIONS.

MAINTENANCE: CONTACT NIDEC INDUSTRIAL SOLUTIONS, CLEVELAND, OH, USA.

CAUTION: BE SURE TO REMOVE POWER BEFORE WIRING THE ENCODER. GROUND THE CABLE SHIELD AT THE ISOLATOR. THE CABLE SHOULD NOT BE GROUNDED MULTIPLE PLACES. AN INTRINSIC SAFETY GROUND IS REQUIRED AT THE XRB1 OR XRB2 ISOLATOR MODULE. ENCODERS INCLUDE A LOCAL GROUND LUG FOR CUSTOMER CONVENIENCE AND ENCODER FRAME GROUNDING IF REQUIRED TO MEET LOCAL ELECTRIC CODE FOR SITE OPERATOR PROTECTION STANDARDS. THIS IS NOT THE REQUIRED FOR INTRINSIC SAFETY GROUND CONNECTION REQUIRED FOR HAZARD PROTECTION AGAINST IGNITION OF EXPLOSIVE ATMOSPHERES.

INTERCONNECTION CABLES SPECIFIED ABOVE ARE BASED ON TYPICAL APPLICATIONS. PHYSICAL PROPERTIES OF CABLE SUCH AS ABRASION, TEMPERATURE, TENSILE STRENGTH, SOLVENTS, ETC., ARE DICTATED BY THE SPECIFIC APPLICATION. GENERAL ELECTRICAL REQUIREMENTS ARE: STRANDED COPPER, 20 THROUGH 16 AWG (INDUSTRIAL EPIC CONNECTOR TYPE OPTIONS CAN USE 14 AWG), TWISTED WIRE PAIRS, BRAID OR FOIL INDIVIDUAL SHIELDS OR OVER ALL SHIELD WITH DRAIN WIRE, 0.03uF OF MAXIMUM TOTAL MUTUAL OR DIRECT CAPACITANCE, OUTER SHEATH INSULATOR, MAXIMUM CABLE LENGTH = 500 FT.. 20 AWG WIRE SHOULD NOT BE USED FOR CABLE RUNS GREATER THAN 61 METERS. IF 20 AWG IS USED WITH EPIC TYPE CONNECTORS THEN THE WIRE ENDS SHOULD BE TINNED.

REFER TO THE WIRING DIAGRAMS ON THE ENCODER AND IN THE SPECIFIC MODEL INSTRUCTION SHEETS FOR SPECIFIC CONNECTOR PIN OUTS AND PHASING TABLES FOR EACH CONNECTOR STYLE OPTION.

REVISIONS				
ECN NO.	REV	DESCRIPTION	DATE	APPROVED

XXXXXX	XXXXXX
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: ANGLES±1° DECIMALS .XX± .03 .XXX± .015
FINISH
PAINT PER PS
PLATE PER
COAT PER PS
ANODIZED PER
OTHER

DRAWN	ZIVKOVIC	7/21/20
CHECKED	SIRACKI	7/21/20
ENG APVD	WOLFF	7/21/20
APVD PROD		

Nidec Industrial Solutions
243 TUXEDO AVENUE
BROOKLYN HEIGHTS, OH 44131

ATEX / IECEx, ZONE 1 & 21 INSTALLATION DRAWING

IMF ☒ PSF ☐

SIZE	CAGE NO.	DWG. NO.	REV
D	0FMV7	D53008	–

SCALE 1/1 | MODEL N/A | SHEET 1 OF 1

REVISIONS				
ECN NO.	REV	DESCRIPTION	DATE	APPROVED
EA0878	A	ADD SPECIAL CONDITIONS FOR SAFE USE PATTON	6/24/15	SHADDUCK

XRYYY XXXX7XXX XXX

- LINE DRIVER OPTION CODE FOR XR850, XR125, XR485, XR685
- CONNECTOR OPTION CODE LOCATION FOR: XR56A, XR56S, XR67A, XR85A, XR115, XR850, XR125, XR485, XR685
- CONNECTOR OPTION CODE LOCATION FOR: XR45, XR47, XR4F
- LINE DRIVER OPTION CODE LOCATION FOR: XR56A, XR56S, XR67A, XR85A, XR115, XR45, XR47, XR4F
- MODEL # CODES: 56A, 56S, 67A, 85A, 115, 45, 47, 4F, 850, 125, 485, 685
- HAZARDOUS LOCATION CODE
  CONNECTOR OPTION CODES = A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, S, T, U, V, W, Y, Z, 2, 3, 4, 5, 6, 7, 8
  LINE DRIVER OPTION CODE = 7 FOR ZONE 2 & 22

XRYY 7 X X XXX

- CONNECTOR OPTION CODE LOCATION FOR: XR5, XR12, XR97
- LINE DRIVER OPTION CODE LOCATION FOR: XR5, XR12, XR97
- MODEL # CODES: 5, 12, 97
- HAZARDOUS LOCATION CODE
  CONNECTOR OPTION CODES = A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, S, T, U, V, W, Y, Z, 2, 3, 4, 5, 6, 7, 8
  LINE DRIVER OPTION CODE = 7 FOR ZONE 2 & 22
  ALL OTHER CODE LOCATIONS ARE NOT RELEVANT TO INTRINSIC SAFETY
  SEE INSTRUCTION SHEETS FOR DEFINITIONS

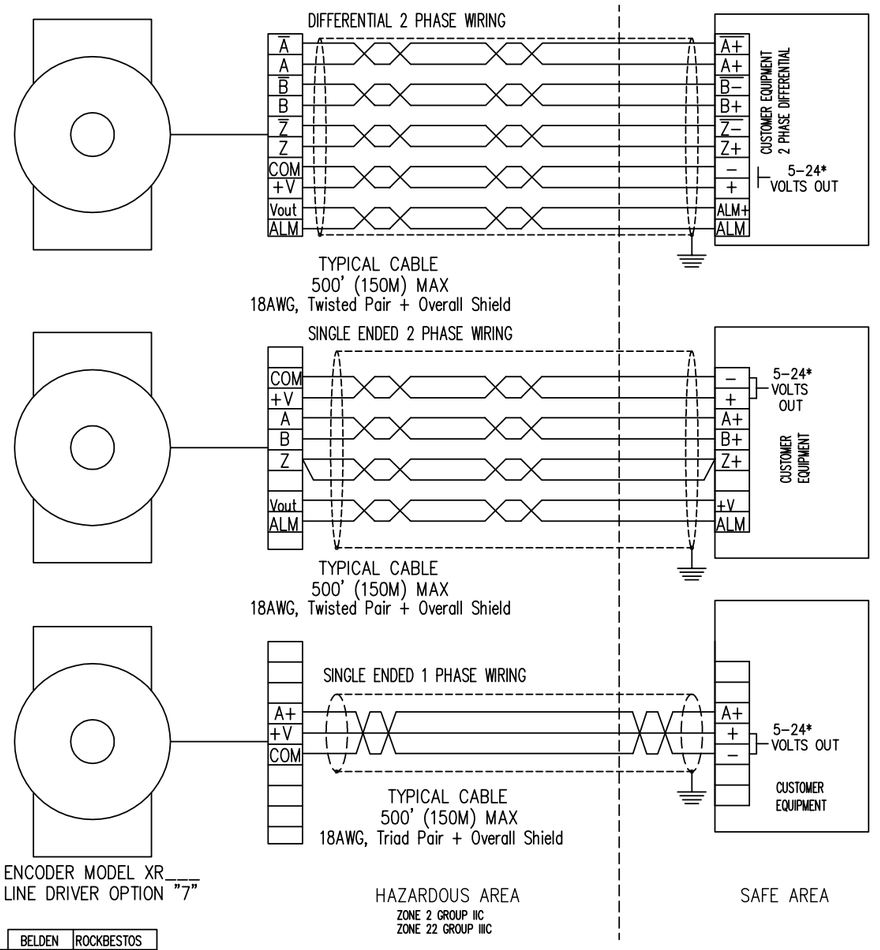
THE XR --- FAMILY OF ENCODERS HAS BEEN EVALUATED TO BE COMPLIANT WITH:
IEC60079-0:2011, EN60079-0:2012/A11:2013
IEC60079-11:2011, EN60079-11:2012
BSEN61000-6-4:2007 AND BSEN61000-6-2:2005
CERTIFICATES OF CONFORMITY TRAC12ATEX0003X, IECEx TRC12.0009X

THE XR --- FAMILY OF ENCODERS IS CERTIFIED FOR USE IN:
GROUP II, CATEGORY 3 (ZONE 2) GAS GROUP IIC WHEN MARKED CE Ex II 3 GD Ex ic IIC* T4 Gc AND
USED WITH A SELV OR EQUIVILENT POWER SUPPLY THAT LIMITS VOLTAGE AND CURRENT PER THE FOLLOWING CHART.
GROUP II, CATEGORY 3 (ZONE 22) DUST GROUP IIIC WHEN MARKED CE Ex II 3 GD Ex ic IIIC T200°C Dc

$-40°C \leq Tamb \leq +80°C$

TABLE 1: ZONE 2 POWER SUPPLY LIMITS			
Ii	Ui		Ci
	IIC	IIB	
250mA	15V	25V	1.8uF
1A		15V	
5A		12V	

THIS DRAWING IDENTIFIES CHARACTERISTICS REQUIRED FOR EQUIPMENT USED IN HAZARDOUS LOCATIONS AND MAY NOT BE CHANGED WITHOUT THIRD PARTY APPROVAL. THIRD PARTIES MUST BE IDENTIFIED FROM EQUIPMENT ID LABELS



	BELDEN	ROCKBESTOS
3 CONDUCTOR	9365	01T18I/S-OS
TYPICAL EXAMPLES		

	BELDEN	ROCKBESTOS
2 PAIR	1063A	02P18I/S-OS
4 PAIR	1064A	04P18I/S-OS
5 PAIR		05P18I/S-OS
8 PAIR	1065A	08P18I/S-OS
TYPICAL EXAMPLES		

SEE INSTRUCTION SHEETS FOR CONNECTOR OPTION PIN OUTS AND PHASING

CABLE CHARACTERISTICS AND INSTALLATION IN ACCORDANCE WITH THE LATEST EDITION OF IEC/EN60079-14/IEC/EC60079-25.

REFER TO THE WIRING DIAGRAMS ON THE ENCODER AND IN THE SPECIFIC MODEL INSTRUCTION SHEETS FOR SPECIFIC CONNECTOR PIN OUTS AND PHASING TABLES FOR EACH CONNECTOR STYLE OPTION.

* ENERGY LIMITED POWER SUPPLY SEE TABLE 1.

WARNING: INSTALLATION SHOULD BE PERFORMED ONLY BY QUALIFIED PERSONNEL. SAFETY PRECAUTIONS MUST BE TAKEN TO ENSURE MACHINERY CANNOT ROTATE AND ALL SOURCES OF POWER ARE REMOVED DURING INSTALLATION.
THE XR___ ENCODERS ARE NOT CONSIDERED AS SAFETY DEVICES AND ARE NOT SUITABLE FOR CONNECTION INTO A SAFETY SYSTEM.
THE XR___ ENCODER CONSTRUCTION MATERIALS CONTAIN NO MORE THAN 7.5% IN TOTAL BY MASS OF MAGNESIUM, TITANIUM AND ZIRCONIUM.
THE CONSTRUCTION MATERIALS ARE NOT CONSIDERED AS ABLE TO TRIGGER AN EXPLOSION IN NORMAL OPERATING MODES. THESE MATERIALS ARE KNOWN TO REACT WITH EXPLOSIVE ATMOSPHERES TO WHICH THE ENCODERS MAY BE SUBJECT. THE CONSTRUCTION MATERIALS DO INCLUDE ALUMINUM. AS SUCH CARE SHOULD BE TAKEN TO AVOID THE POSSIBILITY OF IGNITION FROM IMPACT OR FRICTION. IT IS THE RESPONSIBILITY OF THE END USER TO ENSURE THAT THE ENCODER IS SELECTED CORRECTLY FOR THE POTENTIALLY EXPLOSIVE ATMOSPHERE IN WHICH THE EQUIPMENT IS TO BE PUT IN SERVICE.

SPECIAL CONDITIONS FOR SAFE USE:

ENCODER:

1. WHEN THE ENCODER IS MARKED AS "ic" THE POWER SUPPLY SITUATED IN THE SAFE AREA MUST BE LIMITED TO THE LEVELS LISTED ON THIS CERTIFICATE AND CABLE MUST BE SELECTED AND INSTALLED IN ACCORDANCE WITH IEC/EN 60079-14 AND IEC/EN 60079-25
2. THE EQUIPMENT SHOULD BE MOUNTED SO AS TO AVOID ELECTROSTATIC CHARGING.

MAINTENANCE: CONTACT NIDEC AVTRON AUTOMATION CORPORATION, 8901 EAST PLEASANT VALLEY ROAD, INDEPENDENCE, OHIO 44131

CAUTION: BE SURE TO REMOVE POWER BEFORE WIRING THE ENCODER. GROUND THE CABLE SHIELD. THE CABLE SHIELD SHOULD NOT BE GROUNDED MULTIPLE PLACES. ENCODERS INCLUDE A LOCAL GROUND LUG FOR CUSTOMER CONVENIENCE AND ENCODER FRAME GROUNDING WITH 14 AWG WIRE IF REQUIRED TO MEET LOCAL ELECTRIC CODE FOR SITE OPERATOR PROTECTION STANDARDS.

INTERCONNECTION CABLES SPECIFIED ARE BASED ON TYPICAL APPLICATIONS. CABLE MUST BE SELECTED AND INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND CANADIAN ELECTRICAL CODE. PHYSICAL PROPERTIES OF CABLE SUCH AS ABRASION, TEMPERATURE, TENSILE STRENGTH, SOLVENTS, ETC., ARE DICTATED BY THE SPECIFIC APPLICATION. GENERAL ELECTRICAL REQUIREMENTS ARE: STRANDED COPPER, 20 THROUGH 16 AWG (INDUSTRIAL EPIC CONNECTOR TYPE OPTIONS CAN USE 14 AWG), TWISTED WIRE PAIRS, BRAID OR FOIL INDIVIDUAL SHIELDS OR OVER ALL SHIELD WITH DRAIN WIRE, 0.05uF OF MAXIMUM TOTAL MUTUAL OR DIRECT CAPACITANCE, OUTER SHEATH INSULATOR, MAXIMUM CABLE LENGTH =500 FT.. 20 AWG WIRE SHOULD NOT BE USED FOR CABLE RUNS GREATER THAN 61 METERS. IF 20 AWG IS USED WITH EPIC TYPE CONNECTORS THEN THE WIRE ENDS SHOULD BE TINNED.

UNLESS OTHERWISE SPECIFIED THE ABOVE NOTES APPLY

XXXXXX	XXXXXX
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: ANGLES±1° DECIMALS .XX± .03 .XXX± .015
FINISH
PAINT PER PS
PLATE PER
COAT PER PS
ANODIZED PER
OTHER

		DATE
DRAWN	NICKOLI	1/13/14
CHECKED	PATTON	3/24/15
ENG APVD	SHADDUCK	3/24/15
APVD PROD		

Nidec Avtron Automation
8901 E.PLEASANT VALLEY ROAD
INDEPENDENCE, OH 44131-5529

ATEX / IECEx ZONE 2, 22 INSTALLATION DRAWING

IMF ☒ PSF ☐

SIZE	CAGE NO.	DWG. NO.	REV
D	0FMV7	D52353	A
SCALE 1/1	MODEL N/A	SHEET 1 OF 1	

REVISIONS				
ECN NO.	REV	DESCRIPTION	DATE	APPROVED
EA0759	A	IS "XXX" 2X, WAS "000" 2X, REMOVED 5, 12, 97 FROM MODEL CODES, IS XR5, XR12 & XR97 WAS XR45 FOR CONNECTOR OPTION CODE LOCATION	8/27/14 NICKOLI	SHADDUCK
EA1779	B	DEL NAME AND ADDRESS FROM LABEL ZIVKOVIC	5/6/20	WOLFF
EA1658	C	UPDATED FOR XRB3 ZIVKOVIC	9/2/20	WOLFF

XRYYY XXXXFXXX XXX

- CONNECTOR OPTION CODE LOCATION FOR: XR56A, XR56S XR67A, XR85A, XR115, XR850, XR125, XR485, XR685
- CONNECTOR OPTION CODE LOCATION FOR: XR45, XR47, XR4F
- LINE DRIVER OPTION CODE LOCATION FOR: XR56A, XR56S, XR67A XR85A, XR115, XR45, XR47, XR4F, XR850, XR125, XR485, XR685
- MODEL # CODES: 56A, 56S, 67A, 85A, 115, 45, 47, 4F, 850, 125, 485, 685
- HAZARDOUS LOCATION CODE

CONNECTOR OPTION CODES = A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, S, T, U, V, W, Y, Z, 2, 3, 4, 5, 6, 7, 8
LINE DRIVER OPTION CODE =F FOR CLASS I DIVISION 1 AND ZONE 0

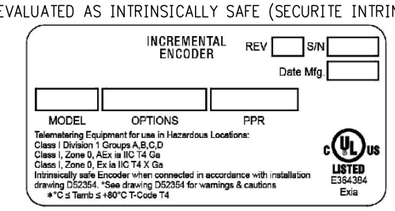
XRYY F X X XXX

- CONNECTOR OPTION CODE LOCATION FOR: XR5, XR12, XR97
- LINE DRIVER OPTION CODE LOCATION FOR: XR5, XR12, XR97
- MODEL # CODES: 5, 12, 97
- HAZARDOUS LOCATION CODE

CONNECTOR OPTION CODES = A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, S, T, U, V, W, Y, Z, 2, 3, 4, 5, 6, 7, 8
LINE DRIVER OPTION CODE = F FOR CLASS I DIVISION 1 AND ZONE 0
ALL OTHER CODE LOCATIONS ARE NOT RELEVANT TO INTRINSIC SAFETY
SEE INSTRUCTION SHEETS FOR DEFINITIONS

TABLE 1

THE XR --- FAMILY OF ENCODERS HAS BEEN EVALUATED AS INTRINSICALLY SAFE (SECURITE INTRINSEQUE) AND COMPLIANT WITH:
UL913 8TH EDITION
UL 60079-0 6TH EDITION
UL 60079-11 6TH EDITION
CSA/CAN C22.2 No. 157 REAFFIRMED 2012
CSA/CAN C22.2 No. 60079-0:11
CSA/CAN C22.2 No. 60079-11:14



* −20°C OR −40°C SEE PRODUCT MARKING

1. INTRINSICALLY SAFE DEVICE INPUT ENTITY PARAMETERS (TERMINALS V(in) & COM):

TERMINAL NUMBERS	Ui (V)	Ii (mA)	Pi (W)	GAS GROUP	Ci (uF)	Li (mH)
V(in) & COM	7.14	416	1.41	A, B, C, D (IIC)	11.88	0

THESE DEVICES HAVE THE FOLLOWING OUTPUT ENTITY PARAMETERS:

TERMINAL NUMBERS	Uo (V)	Io (mA)	Po (W)	GAS GROUP	Co (uF)	Lo (uH)
A & A/ B & B/ Z & Z/	7.14	416	1.41	A & B (IIC)	11.89	2
				C & D (IIB)	11.91	100

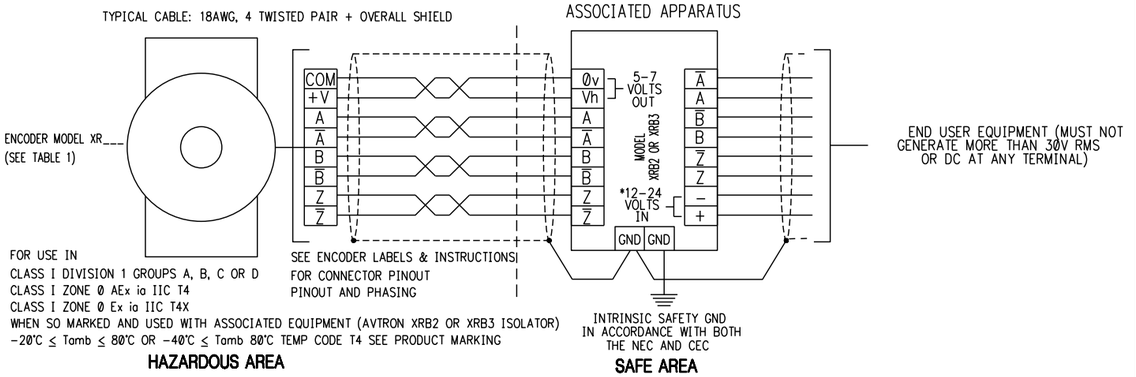
2. CAPACITANCE AND INDUCTANCE CONNECTED TO THE OUTPUT TERMINALS MUST BE ADDED TO Ci AND Li OF THE INPUT TERMINALS OF THE ENCODER WHEN DETERMINING THE MAXIMUM CAPACITANCE AND INDUCTANCE APPARENT AT THE INPUT TERMINALS. WHERE THE CABLE CAPACITANCE AND INDUCTANCE PER FOOT ARE NOT KNOWN, THE FOLLOWING VALUES SHALL BE USED: Ccable = 60 pF/Ft., Lcable = 0.2 uH/Ft.
WHEN MAKING CONNECTIONS TO A SUITABLE ASSOCIATED APPARATUS, THE FOLLOWING GUIDELINES MUST BE FOLLOWED:

I.S. EQUIPMENT		ASSOCIATED APPARATUS
Ui	≥	Voc OR Vt (OR Uo)
Ii	≥	Isc OR It (OR Io)
Pi	≥	Po
Ci + Ccable	≤	Ca (OR Co)
Li + Lcable	≤	La (OR LO)

IF Po OF THE ASSOCIATED APPARATUS IS NOT KNOWN, IT MAY BE CALCULATED USING THE FORMULA Po = (Voc * Isc)/4 = (Uo * Io)/4

THIS DRAWING IDENTIFIES CHARACTERISTICS REQUIRED FOR EQUIPMENT USED IN HAZARDOUS LOCATIONS AND MAY NOT BE CHANGED WITHOUT THIRD PARTY APPROVAL. THIRD PARTIES MUST BE IDENTIFIED FROM ID LABELS.

UNLESS OTHERWISE SPECIFIED THE ABOVE NOTES APPLY



3.) SPECIAL CONDITIONS FOR SAFE USE (X MARKING FOR CuL): THIS EQUIPMENT IS INTENDED FOR A FIXED INSTALLATION AND SHOULD BE MOUNTED SO AS TO AVOID ELECTROSTATIC CHARGING. CLEAN ONLY WITH A DAMP CLOTH. THE CONSTRUCTION MATERIALS DO INCLUDE ALUMINUM. AS SUCH, CARE SHOULD BE TAKEN TO AVOID THE POSSIBILITY OF IGNITION FROM IMPACT OR FRICTION. FOR EXAMPLE, WHEN IN CONTACT WITH SHAFTS MADE FROM IRON OR STEEL. IT IS THE RESPONSIBILITY OF THE END USER TO ENSURE THAT THE ENCODER IS SELECTED CORRECTLY FOR THE POTENTIALLY EXPLOSIVE ATMOSPHERE IN WHICH THE EQUIPMENT IS TO BE PUT IN SERVICE.

4.) WARNING INSTALLATION SHOULD BE PERFORMED ONLY BY QUALIFIED PERSONNEL. SAFETY PRECAUTIONS MUST BE TAKEN TO ENSURE MACHINERY CANNOT ROTATE AND ALL SOURCES OF POWER ARE REMOVED DURING INSTALLATION.

5.) THIS EQUIPMENT IS AVAILABLE AS A SYSTEM CONSISTING OF 1 MODEL XR___ ENCODER AND ONE ISOLATOR MODULE MODEL XRB2 OR XRB3 PER OUTPUT. THAT IS 2 ISOLATOR MODULES REQUIRED FOR A DUAL OUTPUT ENCODER. MULTIPLE ISOLATORS (ASSOCIATED APPARATUS) SHALL NOT BE CONNECTED TO A SINGLE ENCODER OUTPUT.

6.) WARNING-EXPLOSION HAZARD: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
AVERTISSEMENT – RISQUE D'EXPLOSION Le substitution de composants peut altérer l'aptitude de Securite Intrinseque.

7.) THIS EQUIPMENT HAS BEEN EVALUATED FOR USE IN A MAXIMUM AMBIENT TEMPERATURE OF 80°C. CONSIDERATION MUST BE GIVEN TO ENSURE FIELD WIRING IS SUITABLY RATED.
Cet équipement a été évalué pour une utilisation dans une température ambiante maximale de 80° C.
IL faut tenir compte pour assurer le câblage est convenablement évalué.

8.) ISOLATORS, ENCODERS AND CABLE MUST BE SELECTED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE AS WELL AS THE CANADIAN ELECTRICAL CODE. CABLE CHARACTERISTICS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE. THE ISOLATOR MUST BE INSTALLED IN ACCORDANCE WITH DRAWING D52463 OR D53007.

9.) WHEN AN ENCODER CONTAINS MULTIPLE ELECTRICALLY ISOLATED SENSOR MODULES, THE WIRING MUST BE IN SEPARATE CABLES TO SEPARATE ISOLATOR MODULES.

10.) INTERCONNECTION CABLES MUST BE SELECTED AND INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND CANADIAN ELECTRICAL CODE.

11.) PERMANENTLY INSTALLED EXTERNAL CABLE, WHEN FACTORY SUPPLIED, HAS THE FOLLOWING CHARACTERISTICS: UL AWM STYLE 2464, 80°C MAXIMUM RATED TEMP., 300V, 2.1A @ 25°C, INDIVIDUAL 22 AWG CONDUCTORS WITH PVC INSULATION THICKNESS = .011", COVERED BY AN OVERALL FOIL SHIELD AND AN OUTER PVC JACKET WHICH IS 0.035" THICK. SUITABILITY FOR INSTALLATION IN PARTICULAR APPLICATIONS IS AT THE DISCRETION OF THE AUTHORITY HAVING JURISDICTION.

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: ANGLES±1° DECIMALS .XX± .03 .XXX± .015
FINISH
PAINT PER PS
PLATE PER
COAT PER PS
ANODIZED PER
OTHER

	NAME	DATE
DRAWN	NICKOLI	7/28/14
CHECKED	SHADDUCK	7/28/14
ENG APVD	SHADDUCK	7/28/14
APVD PROD		

Nidec Industrial Solutions
243 TUXEDO AVENUE
BROOKLYN HEIGHTS, OH 44131

DIVISION 1 ZONE 0 ENCODER INSTALLATION DRAWING

IMF ☒ PSF ☐

SIZE	CAGE NO.	DWG. NO.	REV
D	0FMV7	D52354	C

SCALE 1/1 | MODEL N/A | SHEET 1 OF 1

XRYYY-X-X---

- CONNECTOR OPTION CODES
  LINE DRIVER OPTION G: H, M, N & 8
  LINE DRIVER OPTION R: A, B, C, D, E, F, J, K, S, T, U, & V
- G - CLASS 1 DIV. 2 LISTED
  R - CLASS 1 DIV. 2 RECOGNIZED — LINE DRIVER CODE
- MODEL #
- HAZARDOUS LOCATION CODE

SEE INSTRUCTION SHEET FOR EACH MODEL FOR EXACT P/N BREAKDOWN

REVISIONS				
ECN NO.	REV	DESCRIPTION	DATE	APPROVED
EA0698	A	UPDATED ENCODER PARAMETERS NICKOLI	5/8/14	SHADDUCK

THE XR --- FAMILY OF ENCODERS HAS BEEN EVALUATED TO BE COMPLIANT WITH:

CSA 22.2 NO. 14-13
CSA C22.2 NO. 213-M1987
ISA 12.12.01 NONINCENDIVE ELECTRICAL EQUIPMENT FOR USE IN CLASS 1 DIVISION 2 HazLoc
UL508 STANDARD FOR INDUSTRIAL CONTROL EQUIPMENT

THE XR --- FAMILY OF ENCODERS IS SUITABLE FOR USE IN HAZARDOUS LOCATIONS:
CLASS I DIV 2 GROUPS A, B, C OR D, OR NON - HAZARDOUS LOCATIONS ONLY.

Cet équipement est adapté à une utilisation en Classe 1, Division 2, Groupes A, B, C et D ou des locations non dangereux.

WHEN SO MARKED AS ABOVE
-40°C<Tamb<+80°C TEMP CODE T4

WARNING: EXPLOSION HAZARD INSTALLATION SHOULD BE PERFORMED ONLY BY QUALIFIED PERSONNEL. SAFETY PRECAUTIONS MUST BE TAKEN TO ENSURE MACHINERY CANNOT ROTATE AND ALL SOURCES OF POWER ARE REMOVED DURING INSTALLATION. SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1 DIVISION 2. DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN REMOVED OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

AVERTISSEMENT-RISQUE D'EXPLOSION Le remplacement de composants peut altérer l'aptitude de Classe 1, Division 2.
AVERTISSEMENT-RISQUE D'EXPLOSION Ne pas déconnector l'équipement à moins que l'alimentation est coupée ou que la zone est connue pour être non dangereux.

ENCODERS PARAMETERS ARE:

	INPUT	OUTPUT
VOLTAGE	5-24VDC	5-24VDC
CURRENT	100mA Nom. 355mA Max.	100mA Max. ea Output

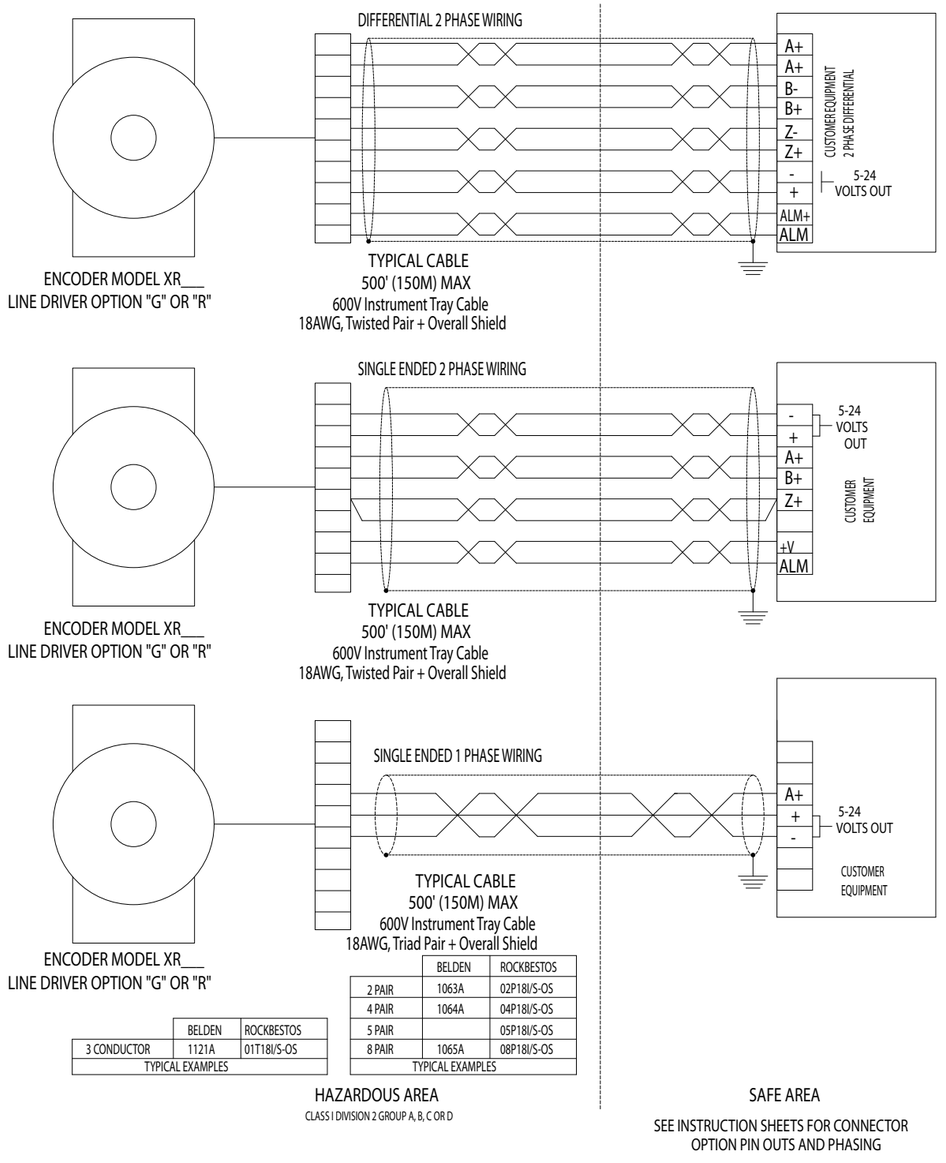
FOR LISTED ENCODERS AND CABLE MUST BE SELECTED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE AS WELL AS THE CANADIAN ELECTRICAL CODE. CABLE CHARACTERISTICS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE (600V INSTRUMENT TRAY CABLE). INTERCONNECTION CABLES SPECIFIED ABOVE ARE BASED ON TYPICAL APPLICATIONS. CABLE MUST BE SELECTED AND INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND CANADIAN ELECTRICAL CODE. PHYSICAL PROPERTIES OF CABLE SUCH AS ABRASION, TEMPERATURE, TENSILE STRENGTH SOLVENTS, ECT., ARE DICTATED BY SPECIFIC APPLICATION. GENERAL ELECTRICAL REQUIREMENTS ARE: STRANDED COPPER, 18 THROUGH 14 AWG TWISTED WIRE PAIRS, BRAID OR FOIL SHIELDS WITH DRAIN WIRE, .05uF OF MAXIMUM TOTAL MUTUAL OR DIRECT CAPACITANCE, OUTER SHEATH INSULATOR, MAXIMUM CABLE LENGTH = 500 FT.. 20 AWG WIRE SHOULD NOT BE USED FOR CABLE RUNS GREATER THAN 61 METERS. IF 20 AWG IS USED WITH THE EPIC TYPE CONNECTOR THE WIRE ENDS SHOULD BE TINNED.

RECOGNIZED MODELS ARE INTENDED TO BE FACTORY WIRED IN ACCORDANCE WITH ISA 12.12.01 CLAUSE 8.8.1.

THIS EQUIPMENT HAS BEEN EVALUATED FOR USE IN A MAXIMUM AMBIENT TEMPERATURE OF 80°C.
CONSIDERATION MUST BE GIVEN TO ENSURE FIELD WIRING IS SUITABLY RATED.

Cet équipement a été évalué pour une utilisation dans une température ambiante maximum de 80 ° C.
Il faut tenir compte pour assurer le câblage est convenablement clasé.

REFER TO THE WIRING DIAGRAMS ON THE ENCODER AND IN SPECIFIC MODEL INSTRUCTION SHEETS FOR SPECIFIC CONNECTOR PIN OUTS AND PHASING TABLES FOR EACH CONNECTOR STYLE OPTION.



	BELDEN	ROCKBESTOS
3 CONDUCTOR	1121A	01T18I/S-OS
TYPICAL EXAMPLES		

	BELDEN	ROCKBESTOS
2 PAIR	1063A	02P18I/S-OS
4 PAIR	1064A	04P18I/S-OS
5 PAIR		05P18I/S-OS
8 PAIR	1065A	08P18I/S-OS
TYPICAL EXAMPLES		

INSTALLATION IN ACCORDANCE WITH THE NEC AND IN ACCORDANCE WITH THE CEC

XXXXXX	XXXXXX
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: ANGLES±1°
DECIMALS .XX± .03 .XXX± .015
FINISH
PAINT PER PS
PLATE PER
COAT PER PS
ANODIZED PER
OTHER

		DATE
DRAWN	NICKOLI	1/8/14
CHECKED	SHADDUCK	1/9/14
ENG APVD	SHADDUCK	1/9/14
APVD PROD		

Nidec Avtron Automation
8901 E.PLEASANT VALLEY ROAD
INDEPENDENCE, OH 44131-5529

DIVISION 2
INSTALLATION DRAWING

IMF ☒
PSF ☐

SIZE	CAGE NO.	DWG. NO.	REV
D	0FMV7	D52355	A

SCALE 1/1 MODEL N/A SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED THE ABOVE NOTES APPLY