Stonel™ valve communication solutions

NEC hazardous area networking guide

Protocol	Topology	Max distance	Max # devices	Cabling
ASi	Not limited	**ASi-3** • 100 m per network segment • Up to 300 m with 2 repeaters and 2 power supplies in series. • Additional distance with multiple parallel repeaters, Tuners and terminators available for special extensions. **ASi-5** • 200 m per network segment	**ASi-3** • 62 per network; 496 max I/O • 4-bits per scan **ASi-5** • 62 per network; 1536 max I/O • 16-bits per scan • Advanced diagnostics	**ASi-3** and **ASi-5** Unshielded, untwisted 2-wire for data and power (16 AWG is preferred).
DeviceNet	Trunk/drop	500 m @ 125 Kbit/s 250 m @ 250 Kbit/s 100 m @ 500 Kbit/s The drop cable length is limited to 6 m per device, with a cumulative drop length limitation by baud rate ranging from 39 m for 500K baud and 156 m for 125K baud.	62	(2) 2-wire with shield (5-wire bundle)
IO-Link	Point-to-point	20 m from IO-Link master to device. Max distance varies on network deployed; 100 m typical for industrial ethernet.	8 to 16 (based on master)	Unshielded, 3-wire (Class A typical with M12 connectors)

Legend

- Ethernet
- General usage
- AS-Interface
- DeviceNet
- IO-Link
- Intrinsically safe
- PLTC/ITC in cable tray (any color)
- PLTC/ITC with strut support (any color)
- PLTC/ITC supported by messenger wire (any color)
- Extra hard usage cable (metal reinforced)
- Metal clad flexible conduit
- Liquidtight flexible conduit
- Rigid metal conduit
- Seal fitting
- Quick mini connector
- Quick mini connector with clasp
- Quick micro connector (general purpose cable)
- Compression fitting

NEC 500 wiring guidelines*

Tray cabling system

Class I & II, Division 2

Conduit/cabling
- Power Limited Tray Cable (PLTC) rated or Instrument Tray Cable (ITC) rated cable used in cable tray.
- PLTC or ITC used as open wiring up to 15 m (50 ft) protected by angles, struts or messenger wire and secured at intervals not exceeding 1.8 m (6 ft).
- PLTC or ITC used in liquidtight or MC flexible conduit.

Connections
- PLTC and ITC may be connected using compression fittinginstalled to avoid tensile stress at termination.
- Flexible cord and quick connectors suitable provided conditions are met as described for nonincendive equipment.

Field instruments
- Must be nonincendive equipment rated.

Special notes
- PLTC power supplies (Class 2 approved) limited to 100 watts with maximum of 60 VDC used to limit energy into the circuit.
- ITC power supplies limited to 5 amps and 150 volts rms.

Nonincendive equipment used in explosionproof and tray cabling systems

Class I & II, Division 2 only

- Seal-offs not required.
- Liquidtight conduit or flexible cord for extra hard usage may be used where flexibility is required.
- Field instruments must be nonincendive equipment rated.
- Quick connectors may be used with the following provisions:
  - Power removed before plugging and unplugging.
  - Current does not exceed 3 amps @ 120 VAC.
  - Cord is listed for hard usage with receptacle and plug of the locking ground type and does not exceed 900 mm (3 ft).
  - A label is attached to the receptable warning against unplugging while energized.

Special notes
- Nonincendive components have current interrupting contacts that are hermetically sealed or non-arcing (solid state).
- Enclosures may be opened while circuits are energized but wiring may not be manipulated until power is removed.

Explosionproof system

Class I & II, Division 1 & 2

Conduit/cabling
- Rigid metal conduit or steel intermediate conduit.
- MI (Mineral Insulated, Metal Sheathed) or MC (Metal Clad) where flexibility required.
- Seal-offs for all enclosures (except those with special ratings).

Connections
- Fittings must be explosionproof approved.

Field instruments
- Complete apparatus must be explosionproof rated.

Special notes
- No seal-offs are required for StoneL JM, Quartz and Axiom (AX).
- Power must be removed before opening enclosures.

Intrinsically Safe (IS) systems

Class I & II, Division 1 & 2

Conduit/cabling
- General purpose cable.
- Cable capacitance and inductance must be considered.
- Barriers (associated apparatus) limit voltage and current.

Connections
- General purpose connectors.
- Quick connectors without limitation.

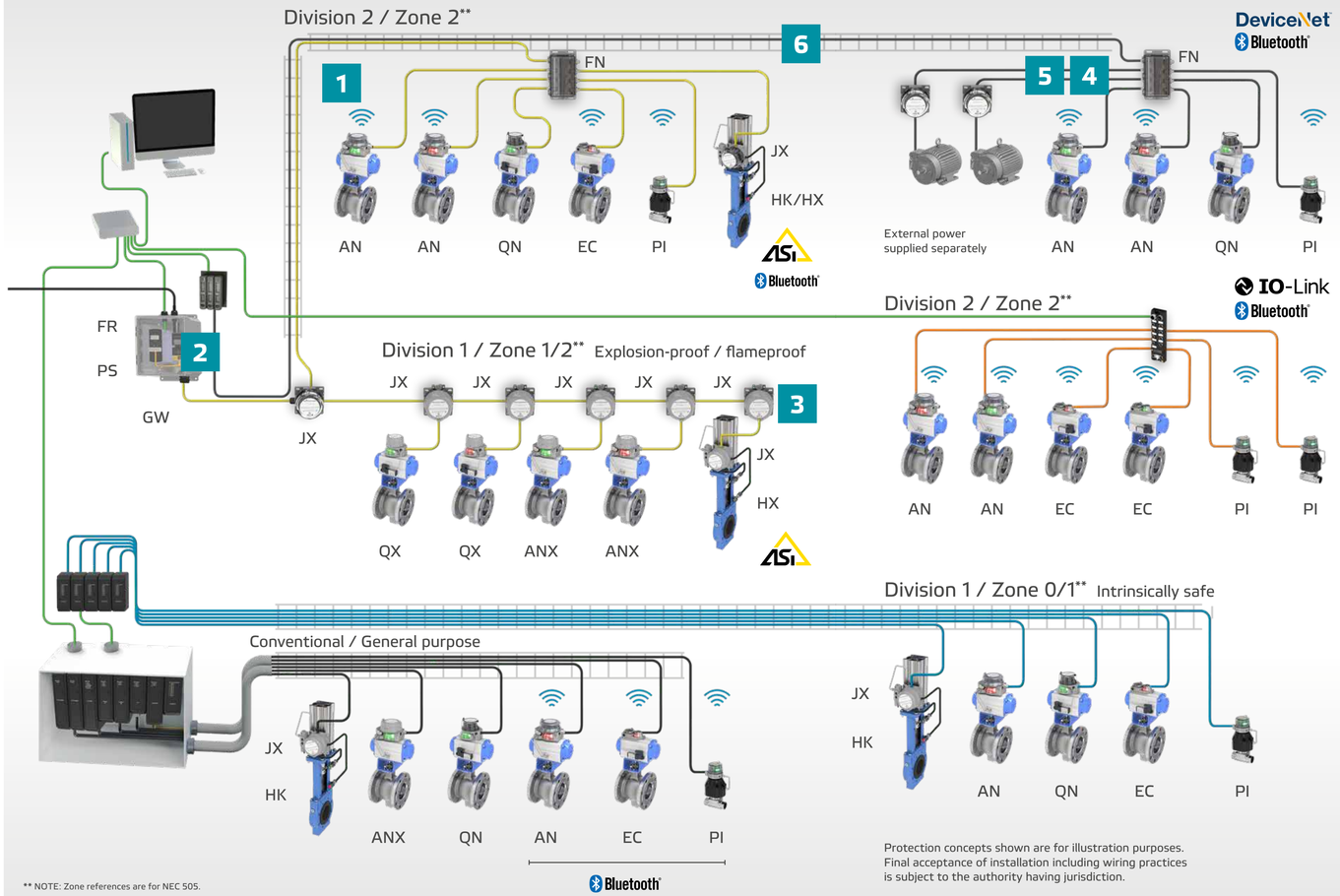
Field instrument components
- Field instruments must be classified as simple (non-energy storing) or IS (IS apparatus).
- IS devices must be approved per FISCO or entity concept.
- Parameter matching using entity concept:

IS apparatus		Associated apparatus
Lowest Vmax in segment	>	Voc
Lowest Imax in segment	>	Isc
Lowest Pmax in segment	>	Pt
Ctotal (field devices+cable)	<	Ca
Ltotal (field devices+cable)	<	La

- Parameter matching using FISCO is same as entity concept except cable and device Li & Ci may be ignored (must be within established FISCO values).

Special notes
- Instrument wiring may be manipulated while energized.
- Protected drop connectors are recommended since bus performance will be affected by short circuit on the spur.

* Reference NEC articles 501, 502 and 504.



** NOTE: Zone references are for NEC 505.

1. Wireless Link (secure)
Enables safe, easy local access to valve status and diagnostics (optional feature)

2. Gateways
EtherNet/IP and other networks for easy network integration

3. Disconnect switches
Enable easy maintenance in XP/Exd applications

4. Drop connectors
Make wiring networks secure and protected

5. Multidrop wiring
Saves space and installation costs

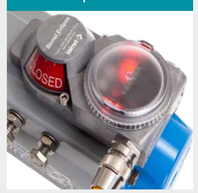
6. Bus networks
Most support XP/Exd wiring (some support Exi wiring)

Protection concepts shown are for illustration purposes. Final acceptance of installation including wiring practices is subject to the authority having jurisdiction.

Axiom™ ANX

Axiom™ AN

Eclipse™ EC



Quartz™ QX/QN/QC/QG

Prism™ PI

Hawkeye™ HK/HX

FieldLink™

I/O

JM

FN

PO16EN - 2/26

valmet.com

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Legend

- AS-Interface
- DeviceNet
- IO-Link
- Intrinsically safe cable (used with HART, Foundation Fieldbus or Conventional)
- Armoured cable
- Non armoured cable
- Armoured cable gland
- Non armoured cable gland
- Compression fitting

IEC wiring guidelines*

Intrinsically Safe (IS) systems

Ex ia Zone 0, 1 & 2

Conduit/cabling
- Use only insulated cable and conductors (test voltage > 500 VAC).
- Separate IS cables from non-IS with spacing (at least 50 mm) or other means (shielding, screens, metal housing). Identify with light blue color unless shielded or metal sheathed cable.
- Cable capacitance and inductance must be considered.
- Barriers (associated apparatus) limit voltage and current.

Connections
- Use glands or compression fittings suitable for particular cable and compatible with enclosure.
- Quick connectors may be acceptable.

Field instrument components
- Field instruments must be classified as simple (non-energy storing) or IS (IS apparatus).
- IS devices must be approved per FISCO or entity concept.
- Parameter matching using entity concept:

IS apparatus		Associated apparatus
Lowest Vmax in segment	>	Voc
Lowest Imax in segment	>	Isc
Lowest Pmax in segment	>	Pt
Ctotal (field devices+cable)	<	Ca
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- Parameter matching using FISCO is same as entity concept except cable and device Li & Ci may be ignored (must be within established FISCO values).

Special notes
- Instrument wiring may be manipulated while energized.
- Protected drop connectors are recommended since bus performance will be affected by short circuit on the spur.

Flameproof system

Ex d Zones 1 & 2

Conduit/cabling
- Rigid metal conduit or steel intermediate conduit may be used. (Not illustrated)
  - Stopping boxes with special compound must be used not more than 50 mm from the flameproof enclosure wall.
  - Standard cables may be used but cross sectional area may not be greater than 40% of conduit.
- Armoured and non armoured cable with robust construction may be used, consisting of extruded inner bed to prevent gas propagation and tough rubber or synthetic sheath.
  - Cable glands rated Ex d and specifically designed for cable type (armoured or non armoured) must be used not more than 50 mm from the flameproof enclosure wall.

Connections
- Fittings must be flameproof approved.

Field instruments
- Complete apparatus must be flameproof approved.

Special notes
- Ex e cabling practices and fittings may be used if the terminal compartment is approved to that standard.
- Power must be removed before opening enclosures.

Nonincendive equipment used in flameproof system

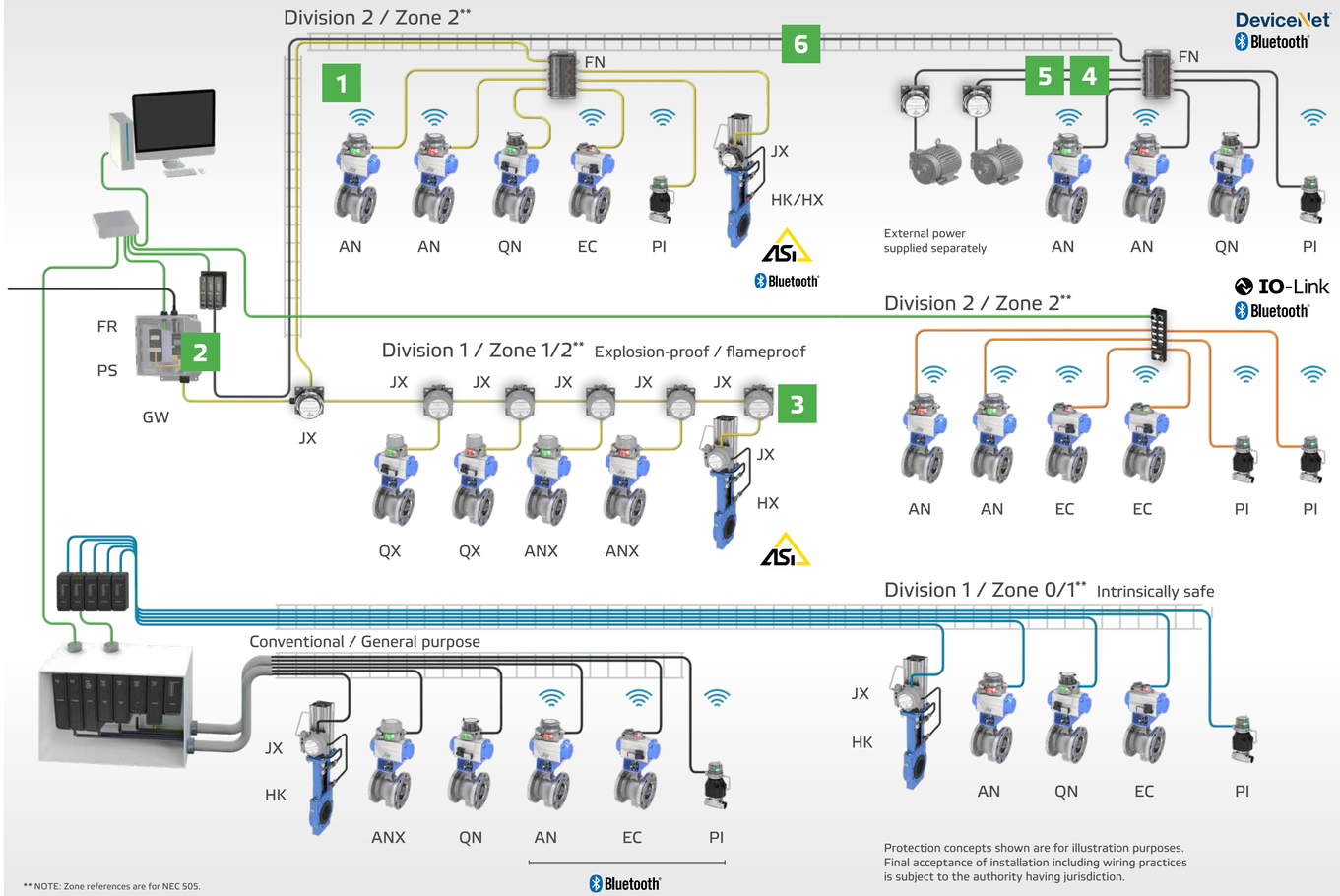
Ex n Zone 2 only

Conduit/cabling
- Same as flameproof.

Connections
- Same as flameproof.

Field instruments
- Approved for use as nonicendive (nonsparking) devices by certified approval agencies.

* Reference IEC60079-14. Guidelines are general in nature and not meant to be comprehensive. Typically they are supplemented at the national level in order to describe detailed practices which are unique to each country.



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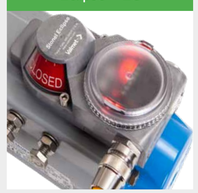

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Prism™ PI

Hawkeye™ HK/HX

FieldLink™

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