



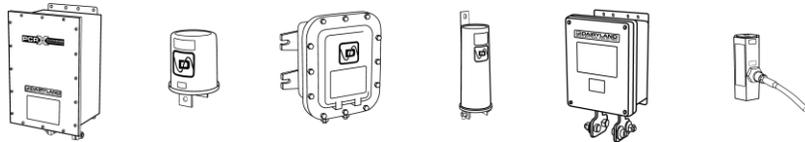
DECOUPLING CATHODICALLY-PROTECTED STATIONS
FROM POWER UTILITY GROUNDING



DAIRYLAND ELECTRICAL INDUSTRIES

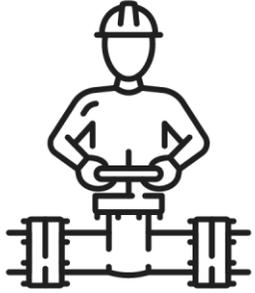
AT DAIRYLAND, WE CULTIVATE INNOVATION TO DELIVER RUGGED AND RELIABLE SOLUTIONS.

Addressing a wide range of complex electrical problems, we engineer our highly specialized products to provide safety protection for assets and personnel across numerous industries. Backed by third-party certifications to standards around the world, Dairyland manufactures products to the highest quality, ensuring unmatched performance.





DAIRYLAND ELECTRICAL INDUSTRIES



SAFETY & PROTECTION

Dairyland products maintain a failure rate of less than 0.01% and are suited for even the harshest conditions, resulting in protection for assets and equipment, and safety for personnel.



QUALITY & PERFORMANCE

Our products are expertly designed and built in-house, certified to global standards, and made with components from vetted suppliers.





DAIRYLAND ELECTRICAL INDUSTRIES



SERVICE & SUPPORT

From customer service and tech support to our extensive library of technical resources, we guide customers to the best solution—even if it's not our product.



CONTINUOUS IMPROVEMENT

We pride ourselves on being an innovative industry leader and are dedicated to upholding this reputation through continuous improvement within the business.





AGENDA

- **WHY IS DECOUPLING FOR ELECTRICAL EQUIPMENT NEEDED?**
- **OPTIONS FOR DECOUPLING FOR ELECTRICAL EQUIPMENT**
- **FOCUS: USING DECOUPLERS TO ISOLATE COMPLEX STATIONS FROM UTILITY GROUNDING**





ELECTRICAL EQUIPMENT GROUNDING

ELECTRICAL EQUIPMENT MUST BE GROUNDED FOR SAFETY

NATIONAL ELECTRIC CODES REQUIRE GROUNDING TO BE:

- Permanent and continuous
- Rated for anticipated fault current
- Low impedance





ELECTRICAL EQUIPMENT GROUNDING

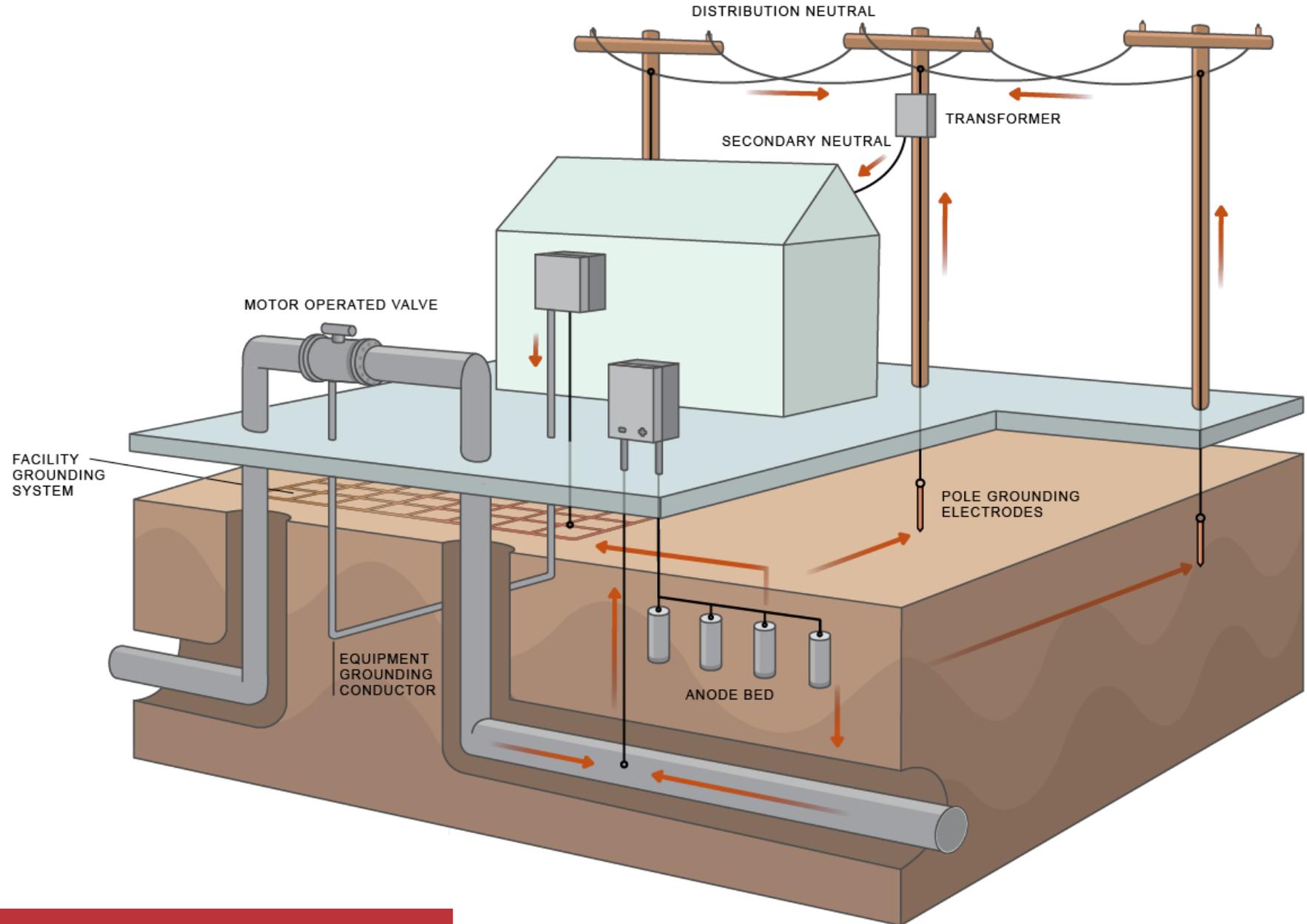
EVEN LOW-VOLTAGE INSTRUMENTATION MUST BE GROUNDED

- Protective grounding: Safety
- Functional grounding: Signal conditioning





ELECTRICAL EQUIPMENT GROUNDING

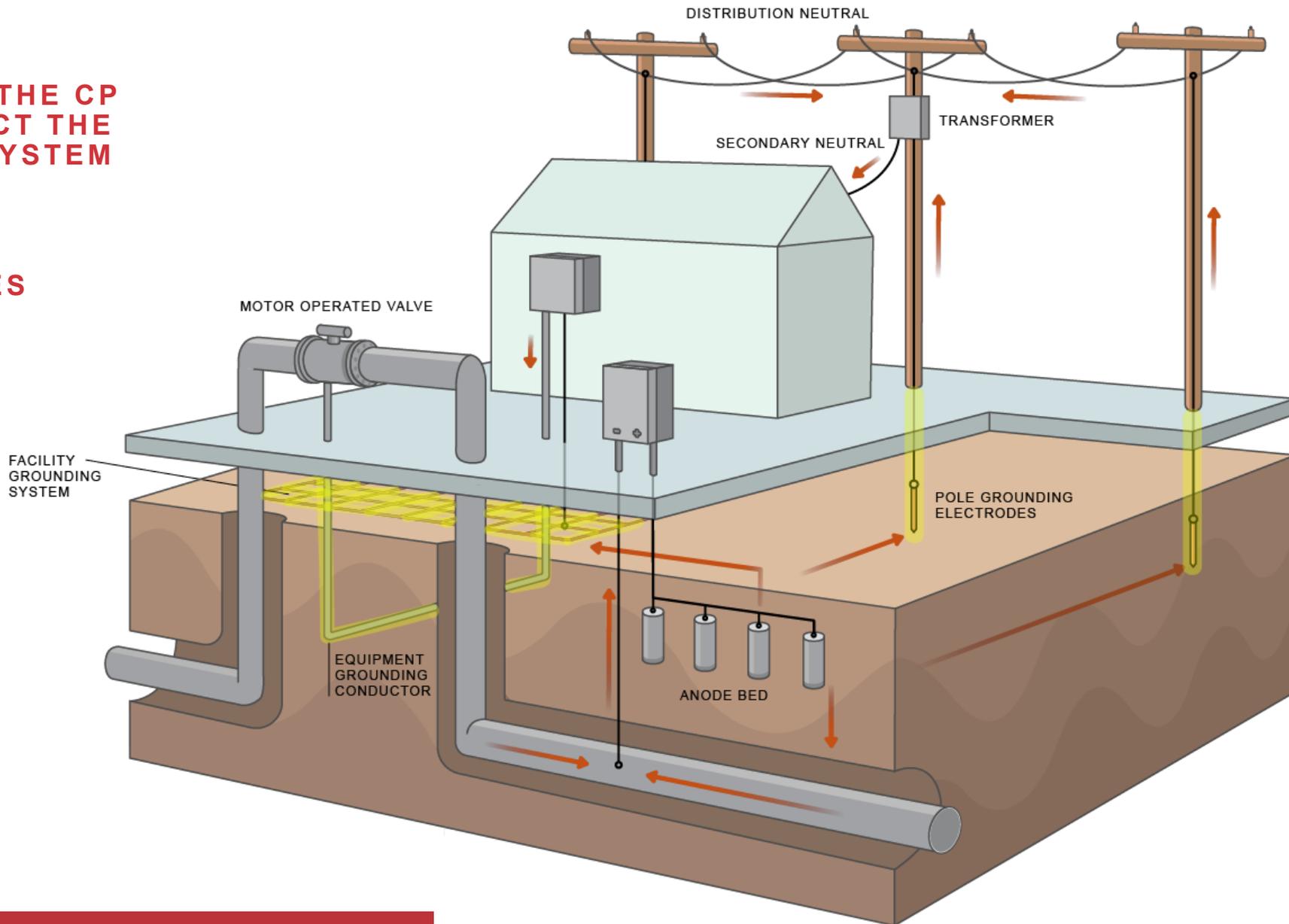




STATION CP WITHOUT ISOLATION

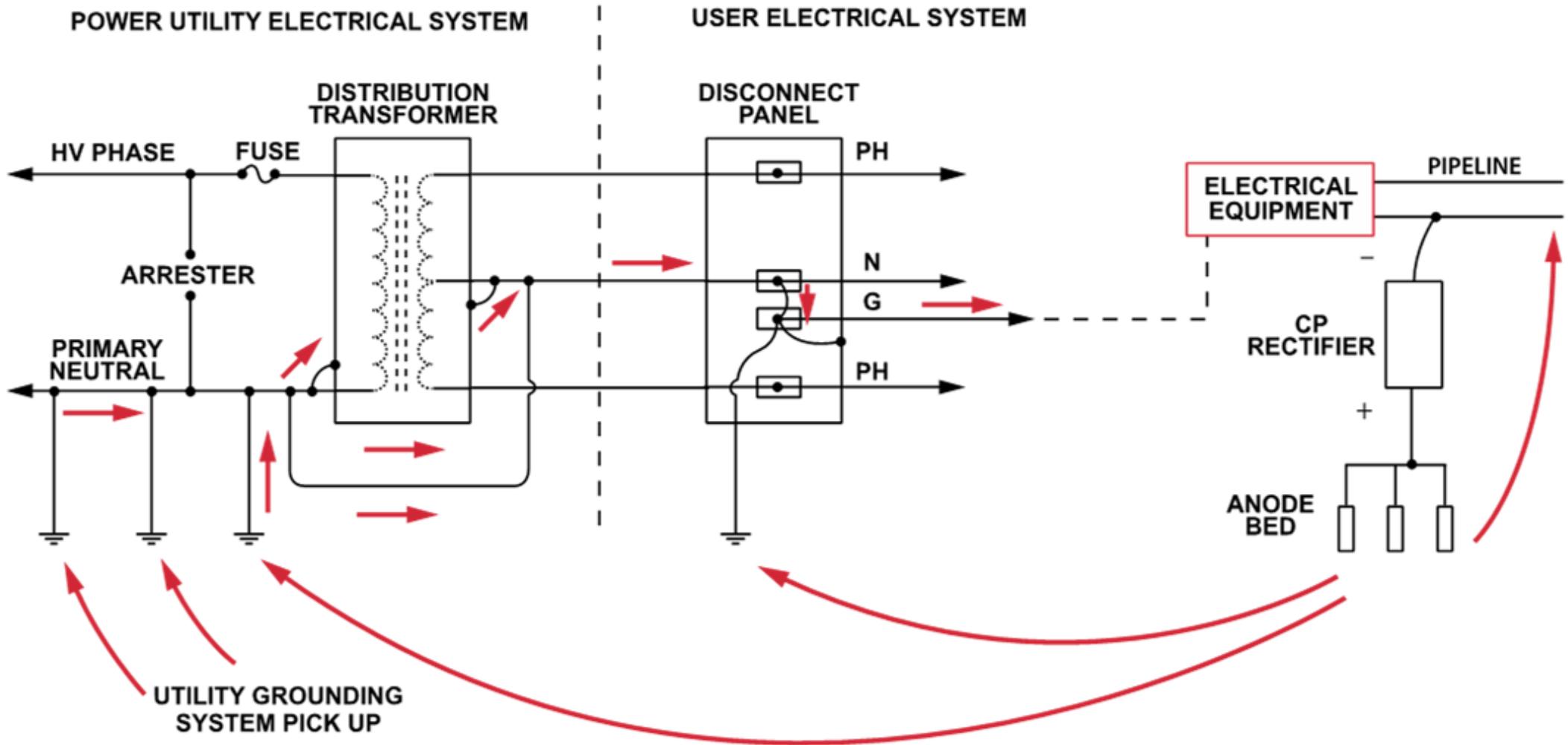
WITHOUT ISOLATION, THE CP SYSTEM MUST PROTECT THE ENTIRE GROUNDING SYSTEM

EFFECTIVE CATHODIC PROTECTION REQUIRES ISOLATION





STATION CP WITHOUT ISOLATION



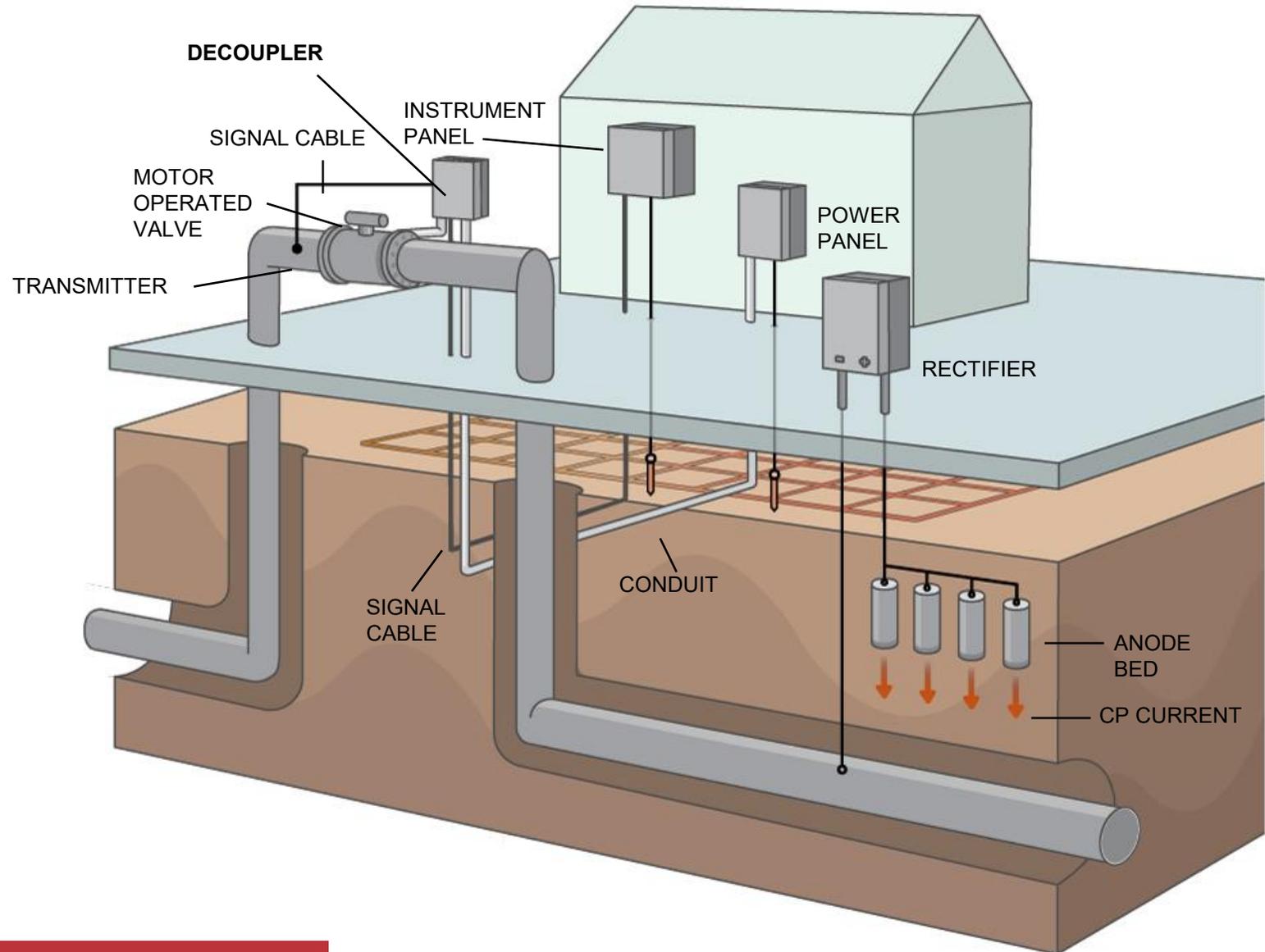


DC ISOLATION USING DECOUPLERS

OPTIONS FOR DECOUPLING

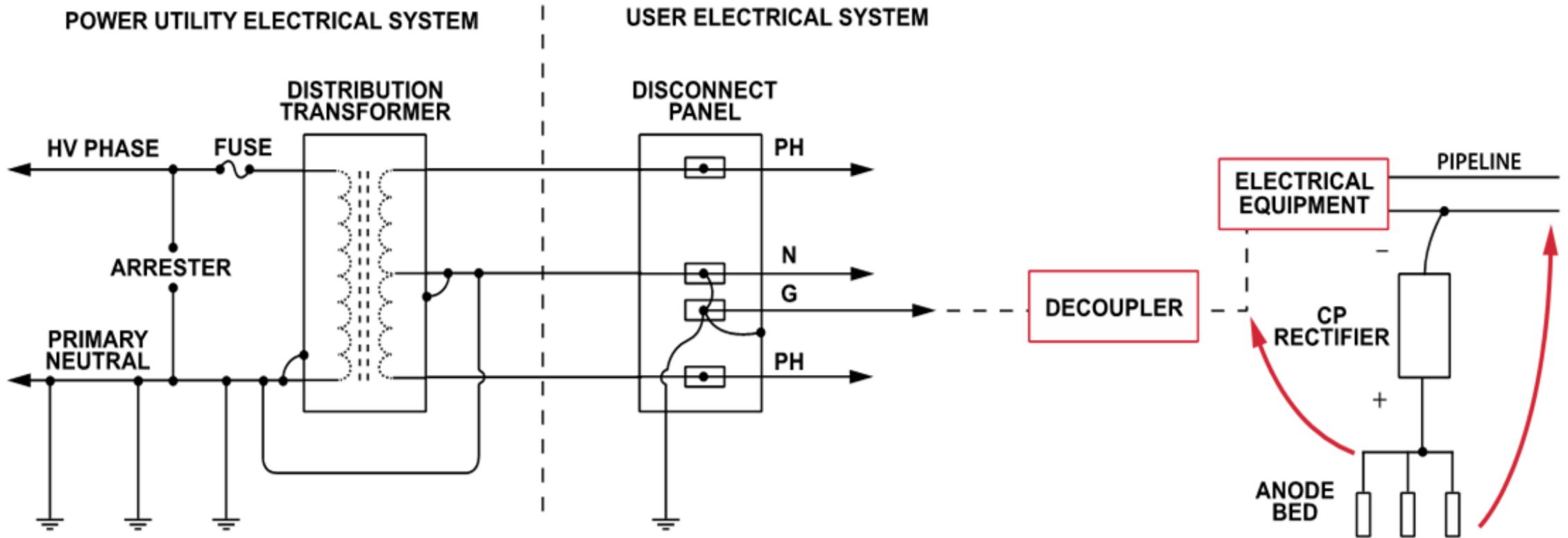
- Install decouplers in series with electrical equipment grounds

Best for simple stations





DC ISOLATION USING DECOUPLERS



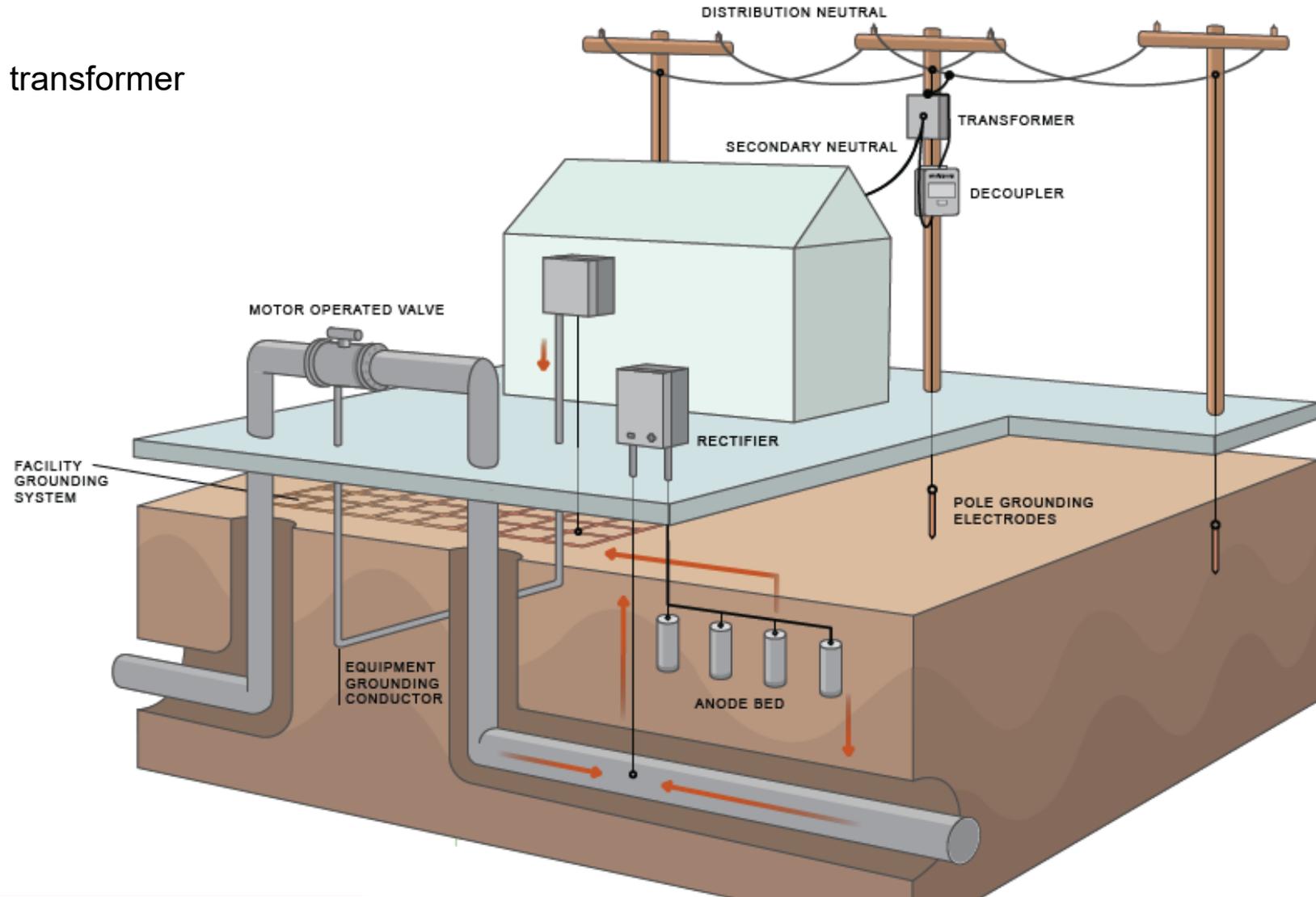


DC ISOLATION USING DECOUPLERS

OPTIONS FOR DECOUPLING

- Install a single decoupler at the transformer feeding power to the station

Ideal for complex stations

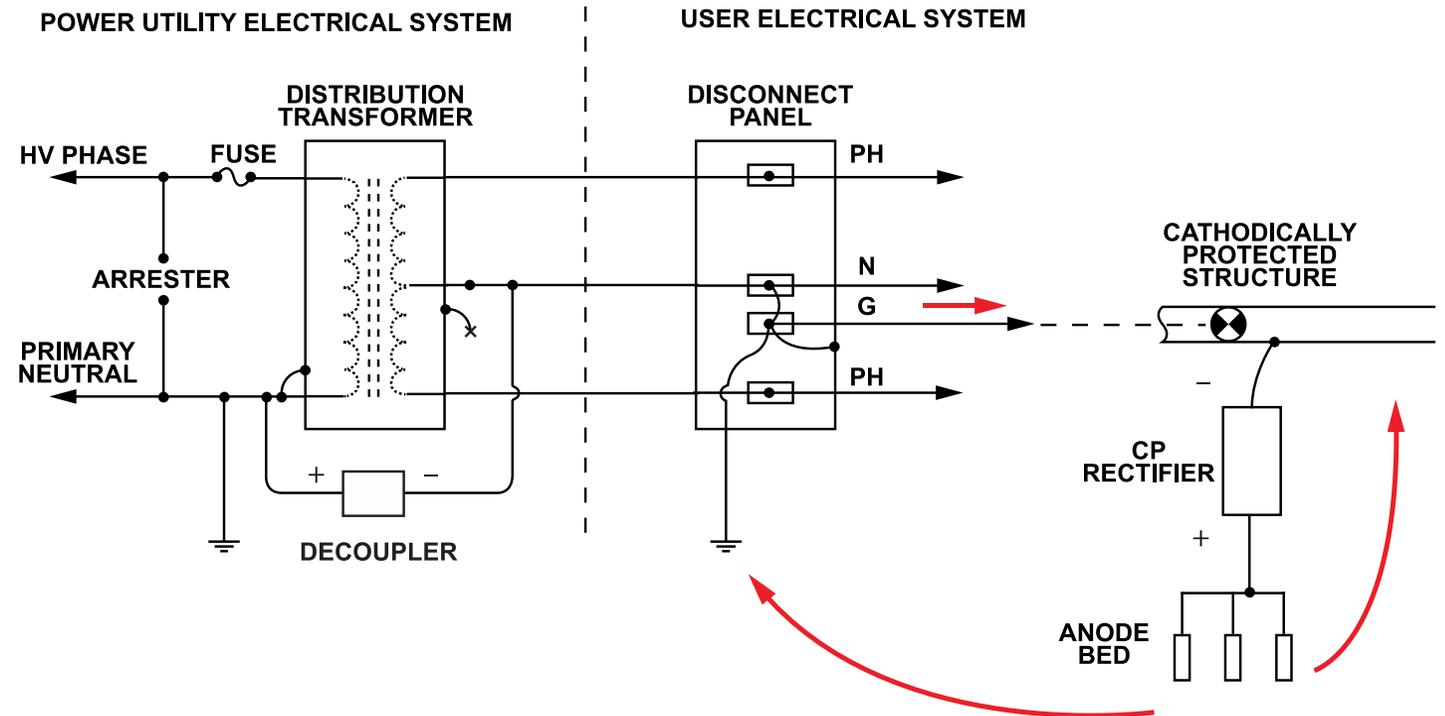




DECOUPLING AT THE TRANSFORMER

BENEFITS

- Simplicity – One decoupler isolates the entire facility from the utility
- Eliminates chance of bonds bypassing the decoupler
- Lower AC fault current decoupler rating required





DECOUPLING AT THE TRANSFORMER

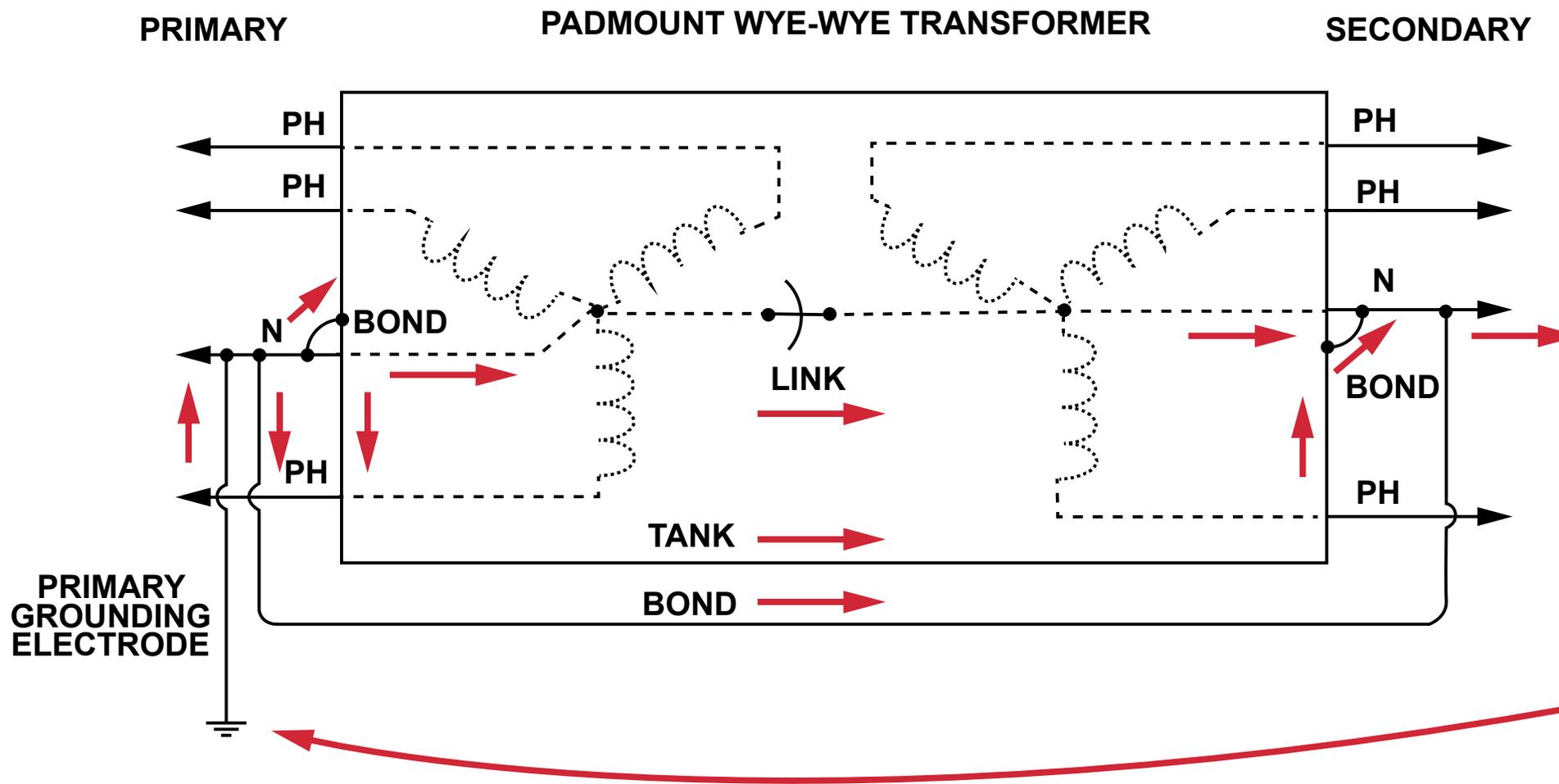
CONSIDERATIONS

- CP system must be designed to protect structures bonded to CP within the station
- May require cooperation with the power utility



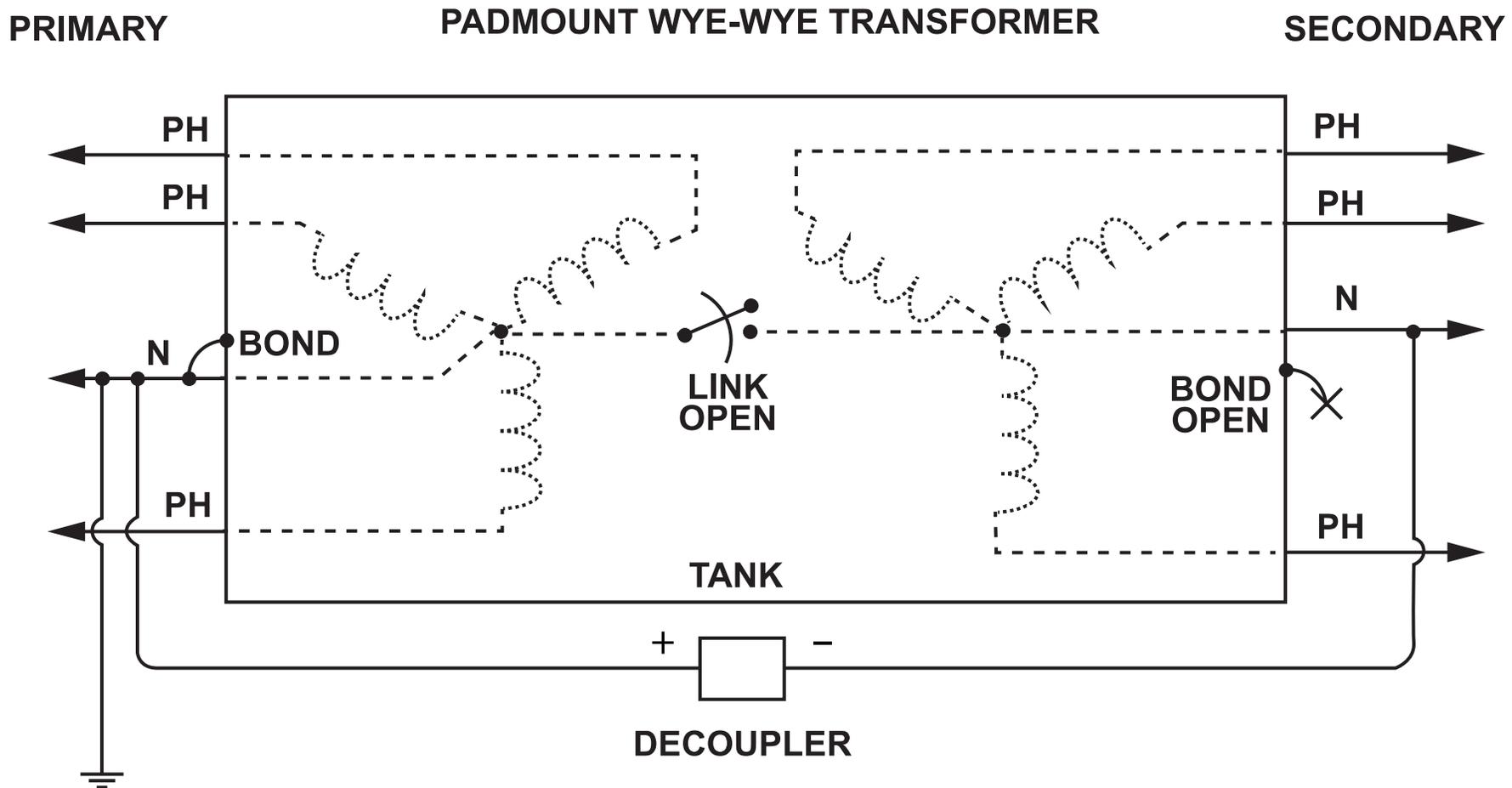


WYE-WYE TRANSFORMER DECOUPLING





WYE-WYE TRANSFORMER DECOUPLING

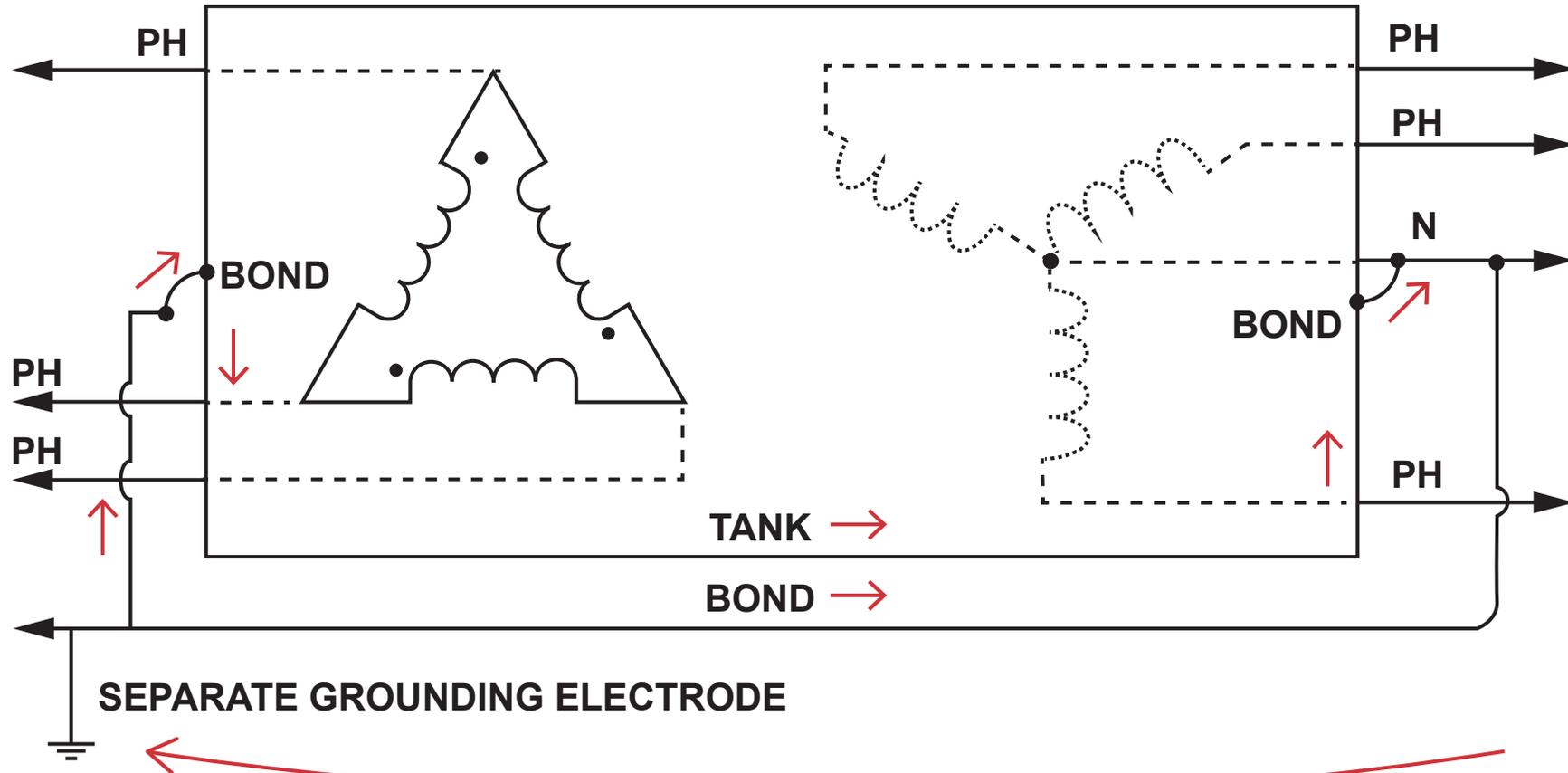




DELTA-WYE TRANSFORMER DECOUPLING

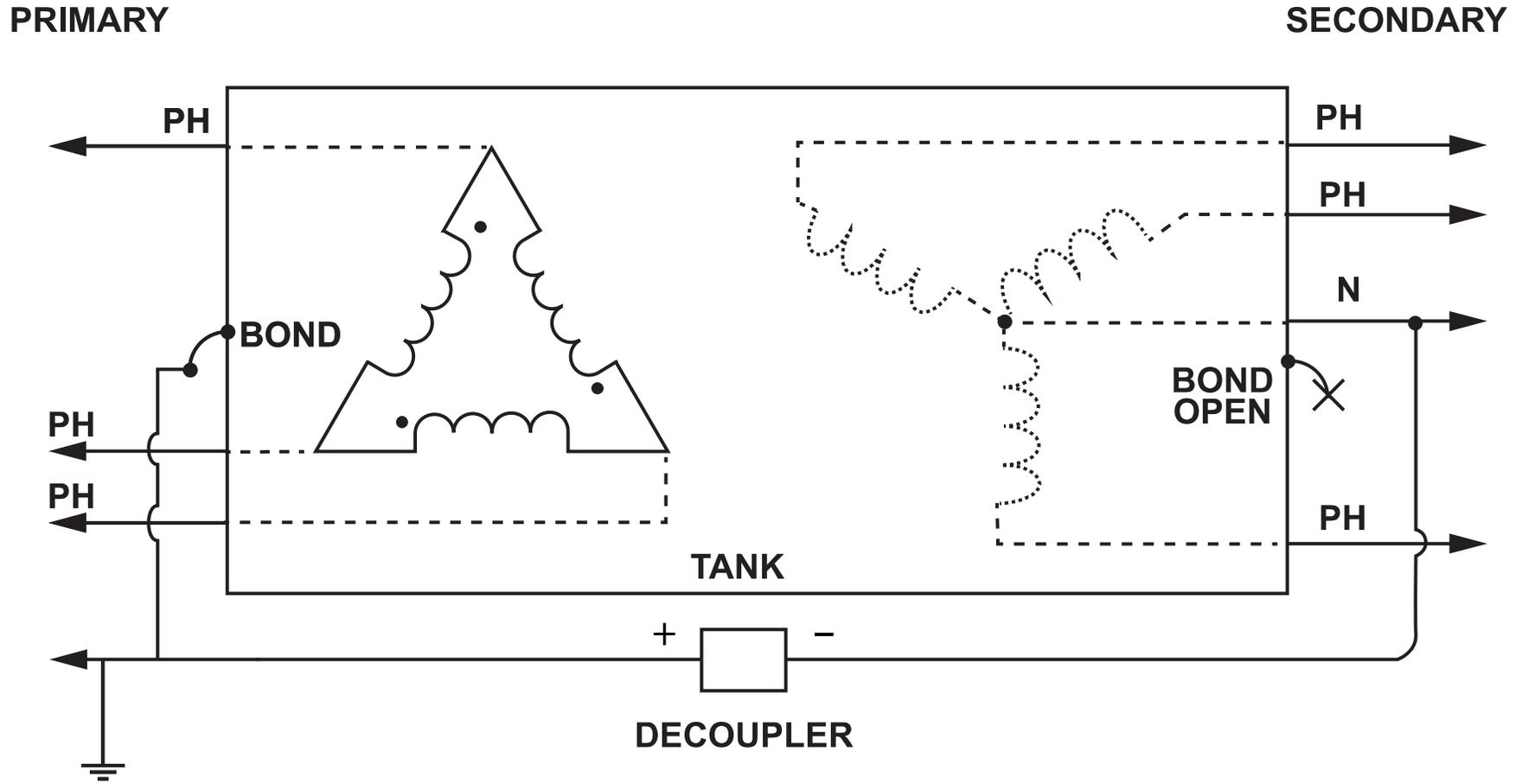
PRIMARY

SECONDARY





DELTA-WYE TRANSFORMER DECOUPLING

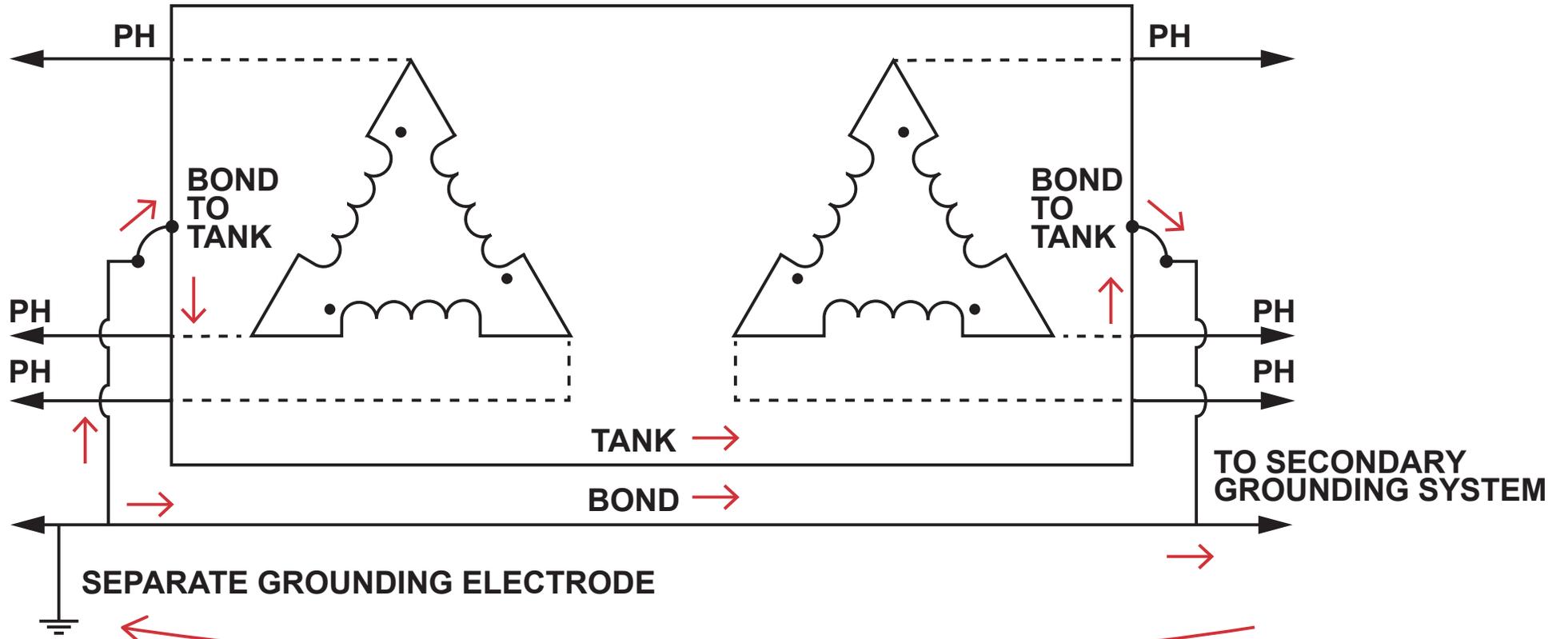




DELTA-DELTA TRANSFORMER DECOUPLING

PRIMARY

SECONDARY

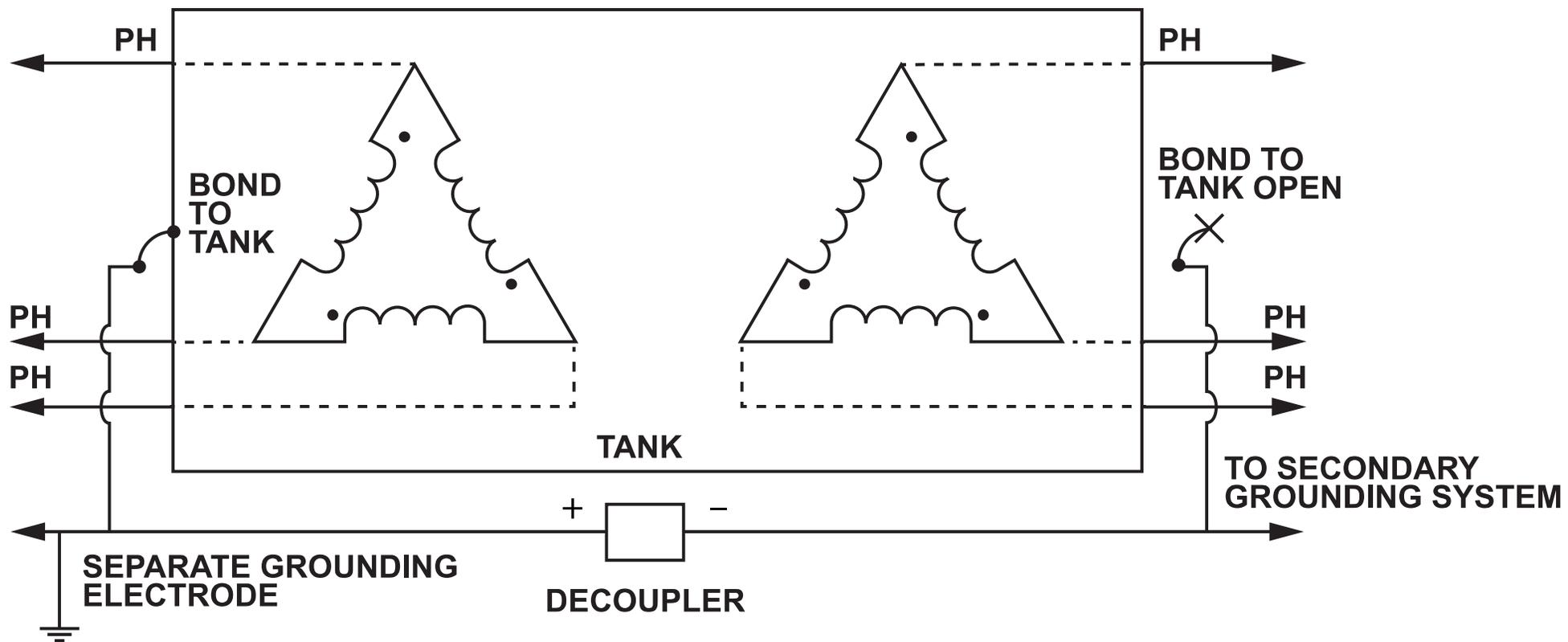




DELTA-DELTA TRANSFORMER DECOUPLING

PRIMARY

SECONDARY

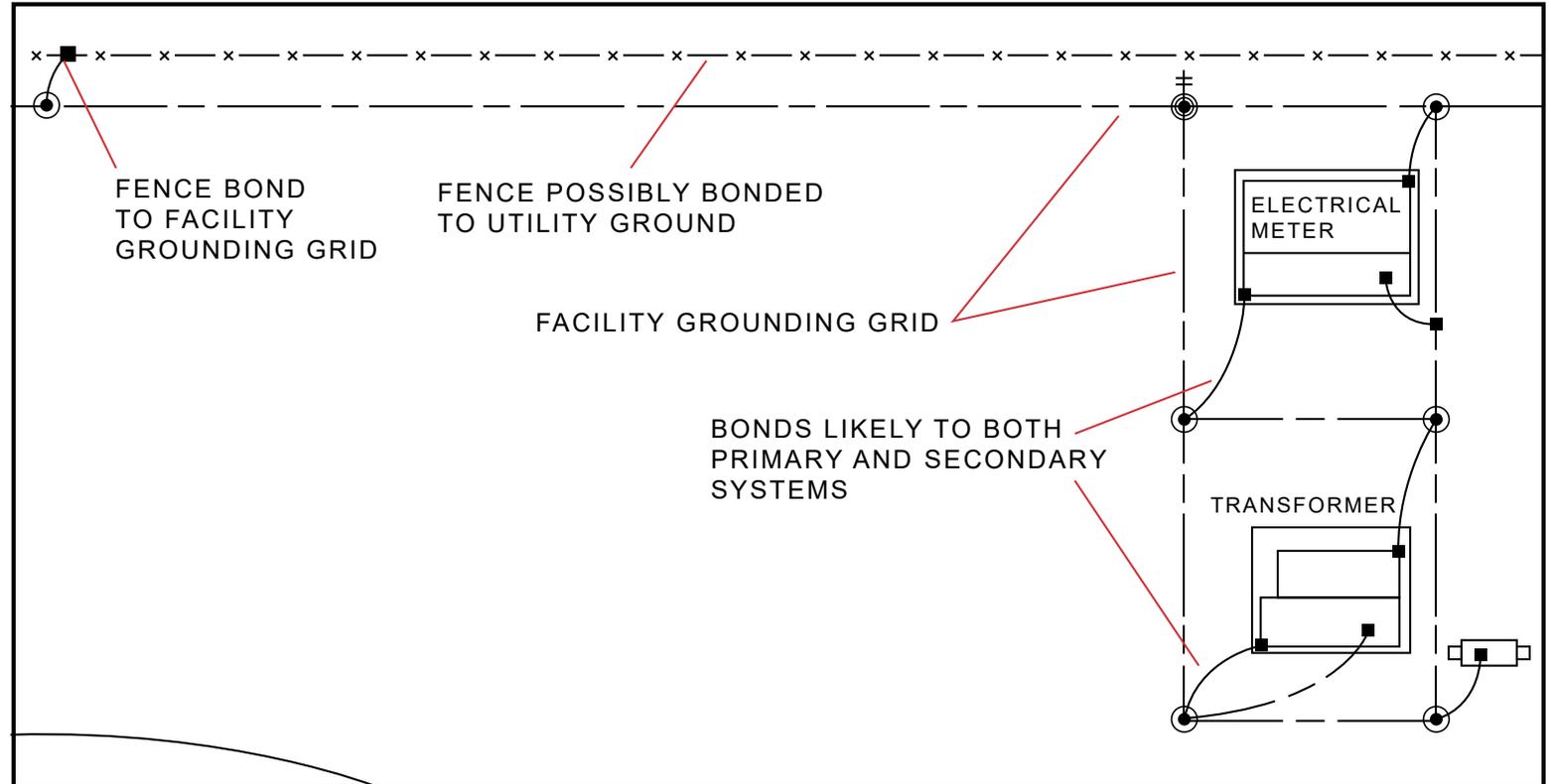




DECOUPLER INSTALLATION

BE MINDFUL OF POTENTIAL BYPASS BONDS

- Shared fencing bonds
- Grounding grids at adjacent property
- Phone sheathing
- Transformer bonds to ground grids





DECOUPLER INSTALLATION

DECOUPLER SELECTION

- PCRs typically used instead of SSDs – larger terminal connections
- No need for PCRX in this application

DECOUPLER RATINGS

- Fault current: Select based on the primary circuit – have the utility specify
- Threshold voltage: Typically, $-3/+1$ with negative terminal connected to the secondary





A PRACTICAL SOLUTION

- A relatively simple, reliable, low-cost solution for improving CP potentials at larger pipeline stations
- Many utilities are familiar with applying Dairyland decouplers at transformers
- Robust ratings and UL certifications make Dairyland products a reliable choice





DAIRYLAND FEATURES & BENEFITS

FAIL-SAFE

Rugged product design assures safety grounding under all product conditions

MAINTENANCE-FREE

Dairyland decouplers require no ongoing maintenance

RUGGED PERFORMANCE

Proven product designs resulting in a low failure rate of less than .01 percent



THIRD-PARTY CERTIFICATION

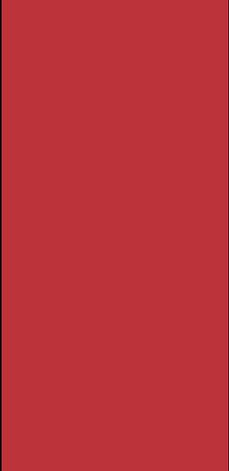
Extensive certification to industry required standards provide assurances to our product claims

ISO CERTIFIED COMPANY

Dairyland's manufacturing processes are overseen by robust standards ensuring consistent quality

RELIABLE SERVICE & SUPPORT

Trained and trusted staff emphasize providing prompt, high quality service and application support



WE'RE HERE TO HELP.
**OUR EXPERIENCED TEAM EXCELS AT FINDING INNOVATIVE
SOLUTIONS FOR YOUR TOUGHEST PROBLEMS.**

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