BPZM-MRD Nitrogen Injection System

(Transformer protector)

Overview

BPZM-MRD Nitrogen Injection Explosion Prevention & Fire Protection System became more advanced fire protection and explosion prevention system for the Oil immersed transformer protection after "Water Spray System" and "CO2 Spray System", BPZM-MRD Systems were also examined by "National Fixed Fire Extinguishing Systems and Components Quality Supervision and Inspection Center" and passed the test as qualified.
Transformer are among the most expensive equipment located in power plants and substations. They generally contain a large quantity of combustible substance, which can spray fire to nearby installations and caused a power failure and huge economic losses. Special attention should therefore be paid to their protection. The traditional protection of transformer usually focuses on the electric parameters of the transformer, while the sudden pressure increased within the tank resulting from insulation breakdown does not draw much attention.

N_2 Bottle Cabinet Installed Outdoor


Control Panel Installed Indoor


BPZM-MRD型变压器排油注氮灭火柜
3号主变
充氮灭火装置

Principle of Explosion Prevention：

If the transformer is not working properly, an enormous amount of flammable gases will be created in the oil tank. As a result, the gas relay closes and the electric breaker switches off. At this moment, the internal pressure of the tank increases due to the thermal inertia. Once the pressure exceeds the setting value of the pressure relief valve (PRV) and the setting value of rupture disk, BPZM-MRD Nitrogen Injection system is operated immediately. Consequently, the oil drain valve opens to draw off oil in order to relieve the pressure inside the tank and prevent any explosion and fire.

Principle of Extinct Fire：

When the transformer is on fire, the fire detector is activated, the gas relay closes, and the electric breaker switches off. As a result, BPZM-MRD Nitrogen Injection system is operated and the oil drain valve opens to draw off oil. Then nitrogen gas is continuously injected, the large amount nitrogen gas sufficiently cools down the transformer, extinguishes fire, and prevents any re-combustion.

Working Conditions:

1, Fire detector, drain valve, fire protection cabinet could be located outdoor. Control panel should be located indoor. Around the site there should be no violent vibration and shock, no corrosive gas.

2, Ambient Temperature

A) outdoor device (the fire prevention part): -40℃ ~ 60℃

B) indoor device (the auto-control panel): 5℃ ~ 30℃

3, Relative Humidity

A) outdoor device (the fire prevention part): ≤95 (@ 20℃±5℃)

B) indoor device (the auto-control panel): ≤85 (@ 20℃±5℃）

4, Power Source

Working power source:DC220V or DC110V

Functions：

Explosion Prevention and Fire Extinguishing

The system can extinguishing the fire immediately thro injected the N2 gas into the Transformer Tank.

The Nitrogen can be injected continuously for 30 mins to stir and cool down the transformer oil, which also isolated the air from the tank.

Characteristics of BPZM-MRD Nitrogen Injection System:

State-of-art concept: rapidly drain oil to prevent explosion and inject nitrogen to prevent and extinct fire.

Excellent performance: utilizing fast valves to drain oil in 0.1s with the technic from the national defence.

Fast response: once a fault signal is detected from the transformer. The oil is drained within 0.2 second after detection in order to release pressure and to avoid explosion. The nitrogen gas is injected after 1 to 20 second in order to mix and cool down the oil, to reduce the concentration of flammable gases, to isolate oxygen gas, and to extinct fire.High

reliability: utilizing the principle of logic signal to prevent any improper or unnecessary activity to the system and to provide a more flexible system.

High efficiency: able to inject nitrogen gas continuously for more than 30 min to completely cool down the transformer oil as well as prevent and extinguish fire.

Reduce pollution: no environmental pollution due to the characteristic of nitrogen gas in FMD. Extinct fire without water is an advantage to the lack of water area.

Feasibility: easy to install and maintain for both new or existing transformers with reasonable investment in a minor price compare to other traditional transformer fire extinction systems, such as water spraying systems and CO2 spraying systems.

Scope of applications:

Generator power unceasingly increase with the development of technology, there are many transformer explosion happened due to ineffective of current breaker between the Generator and Power Transformer.

BPZM-MRD Nitrogen Injection System is suitable for new or remodeled power transformer which located in the high power plant, substations, indoor substations, underground substations, city substations and cold and water-deficient area.

Information Required to Quote

1, layout drawing, contact details of transformer manufacturer and system designing company.

2, if any special requirement, please indicate.

Appendix

1.Nitrogen Quantity of Three Different Transformer Capacity.

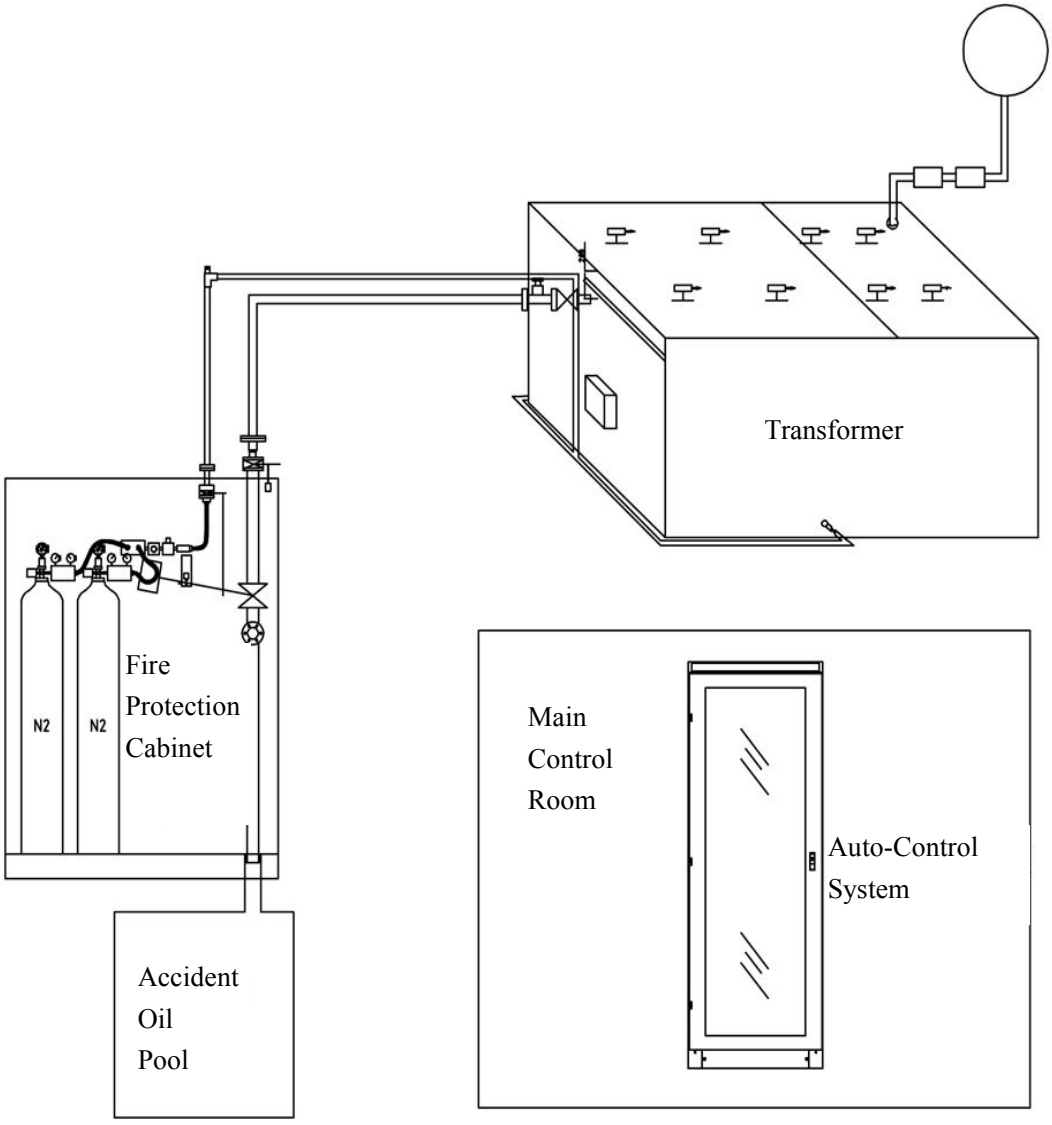
2.Sketch Drawing of the Fire Protection System

3.Assembly Drawing of fire prevention cabinet and fire control cabinet

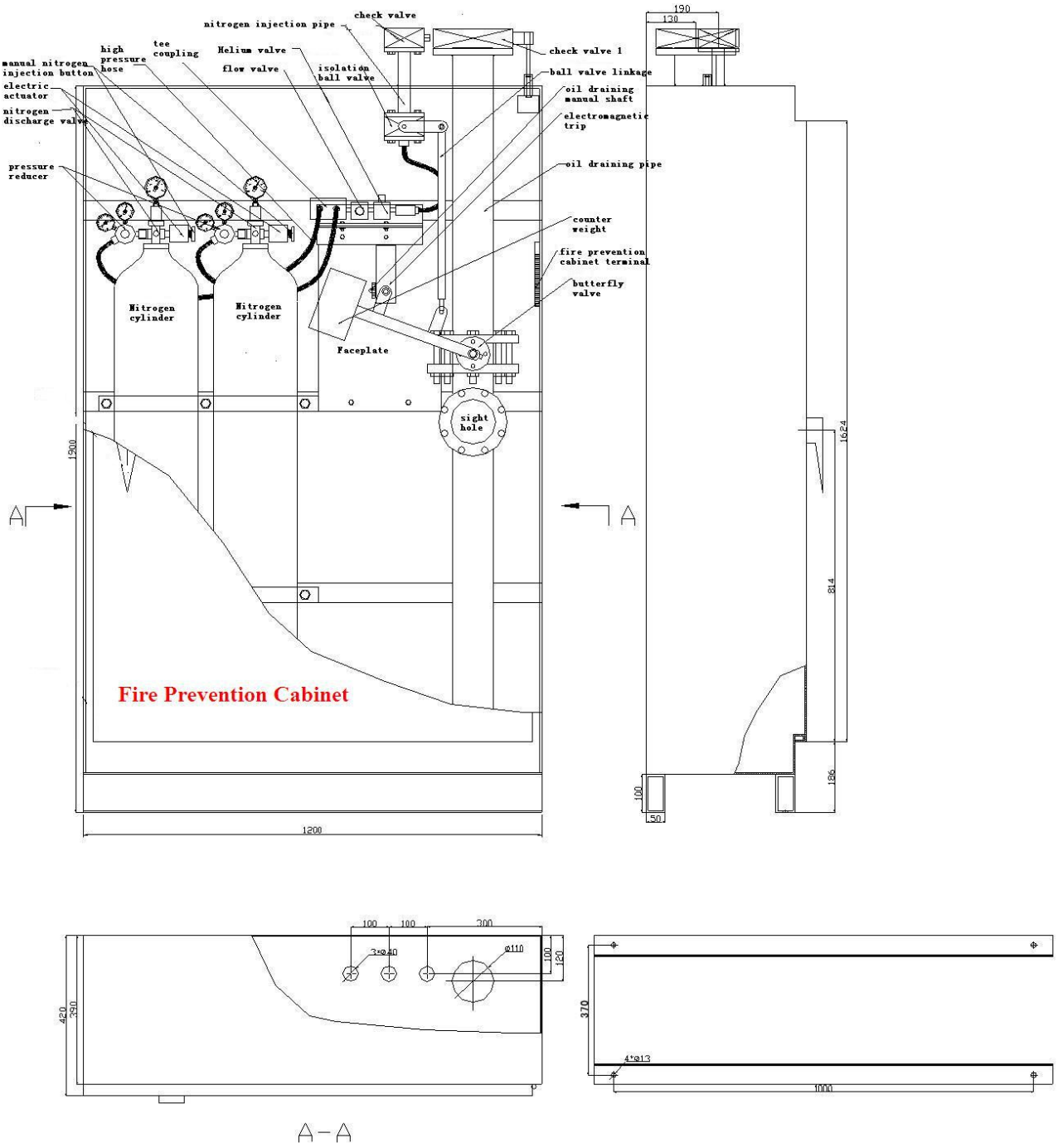
1.Nitrogen Quantity of Three Different Transformer Capacity.

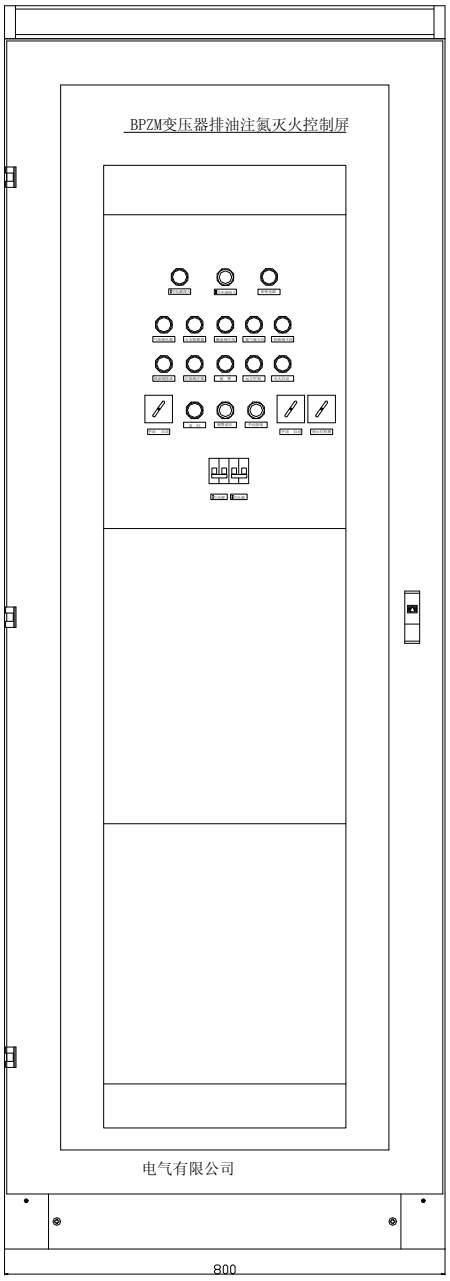
Transformer Capacity（MVA）	≤50		＞50,≤240	＞240
Nitrogen Cylinder Volum（L)	40	60	40	40
Nitrogen Cylinder Quantity	1	1	2	4
Nitrogen Cylinder Initial Pressure（Mpa）	15			
Nitrogen Pressure after pressure reduction（Mpa）	0.6			
Nitrogen Volum after pressure reduction（L)	1000	1500	2000	4000
Continuous Nitrogen Injection Time（min）	31			
Fire-extinguishing time（min）	less than1min	less than 1min	less than 1min	less than 1min
Nitrogen Injection Valve Outlet Flow（L/min)	32.25	48.4	64.5	129
Nitrogen Flow Rate in Nitrogen Injection Tube（m/s）	1.095	3.28	2.19	4.38
Nitrogen Injection Hole Quantity	2	2	4	6
Nitrogen Injection Flow（L/min)	16.25	24.2	32.5	32.5
Temperature Detector Quantity	6	6	8	12
Temperature Detector Operating Temperature （℃）	130℃±10%	130℃±10%	130℃±10%	130℃±10%
Oil Drain Tube Diameter（mm）	≥DN100	≥DN100	≥DN125mm	≥DN125mm
Nitrogen Injection Tube Diameter（mm）	DN25			
Quick Discharge Valve Operting Time （s）	＜1s			
Fire Extinguishing Cabinet Operating Temperature(℃)	Ⅰ:－20℃～60℃ Ⅱ:－40℃～60℃（Ⅱmeans in high and cold area）			

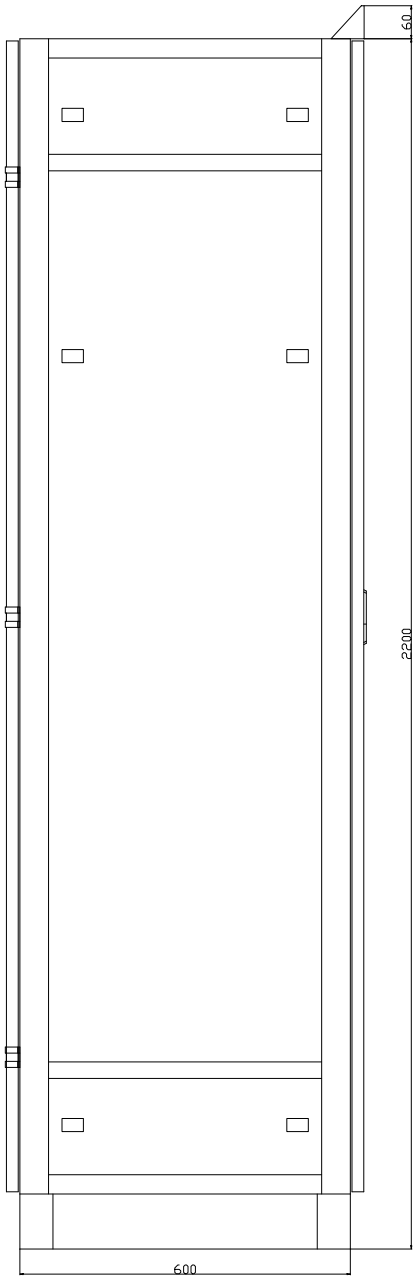
2.Sketch Drawing of the Fire Protection System

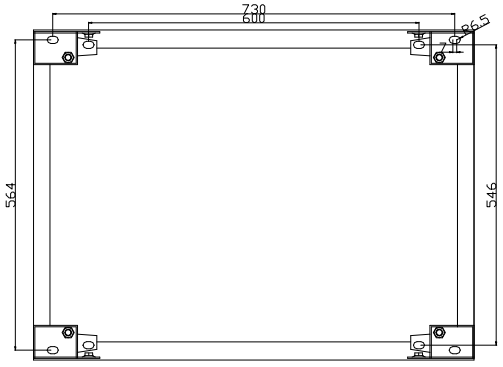


3. Assembly Drawing of fire prevention cabinet and fire control cabinet




BPZM变压器排油注氮灭火控制屏
电气有限公司
800


60
2200
600


730
600
86.5
564
546