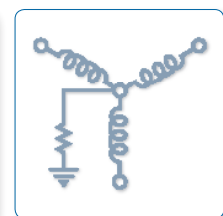
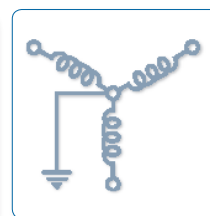
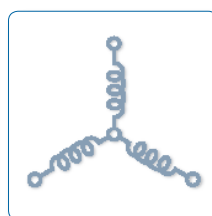
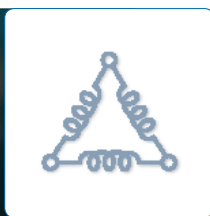




GP/GPA

GROUND FAULT PROTECTION



ABOUT I-GARD

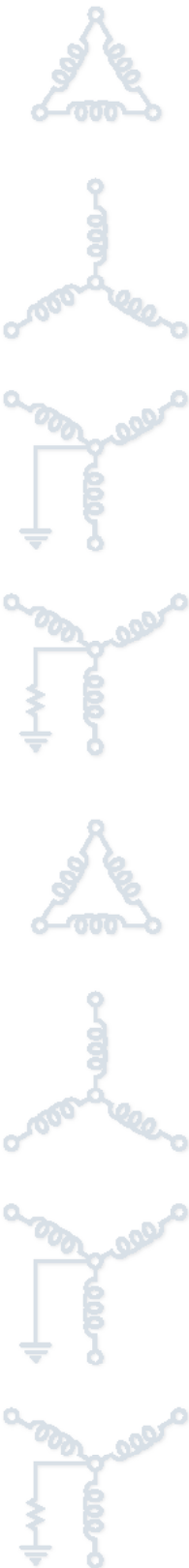
I-Gard's commitment to electrical safety provides both industrial and commercial customers with the products needed to protect their electrical equipment and the people that operate them.

As the only electrical-safety focused company whose product portfolio includes neutral grounding resistors, high-resistance grounding systems and optical arc mitigation, we take pride in our technologies that reduce the frequency and impact of electrical hazards, such as arc flash and ground faults.

For those customers who have purchased from us over the last 30 years, you know us for the quality and robustness of our products, our focus on customer service and technical leadership. We build on this foundation by investing in developing new products in electrical safety education - including EFC scholarship program - by actively participating in the IEEE community programs on technical and electrical safety standard, and working with local universities at discovering new technologies. We remain unrelenting in our goal of improving electrical safety in the workplace.

Our commitment to excellence is validated by long-standing relationships with industry leaders in fields as diverse as petroleum and gas, hospitals, automotive, data centers, food processing, aerospace, water and waste water plants, and telecommunications. We provide our customers with the product and application support required to ensure that their electrical distribution system is safe and reliable.

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1. INTRODUCTION

I-Gard “Lifeguard” ground fault protection equipment is designed to provide complete electrical safety in areas where personnel may come in contact with dangerous ground leakage currents when the normal grounding system has become unreliable because of corrosion, mechanical damage, wear or just the aging of the wire insulation, which may gradually break down.

2. APPLICATION

The 3 phase, single circuit, permanently mounted Pump Protection Panels are designed to provide instantaneous ground fault protection for an individual electrical load on grounded or ungrounded electrical systems up to 600 volts and 85 amps. at 5 or 10 milliamperes ground leakage current.

Any 3 phase circuit, particularly those feeding pump motors for decorative pools, water fountains, pipe lines or any motor, heater or similar load, located in damp or wet areas, such as marinas, shipyards, dairies, food processing plants and breweries can be protected by these Pump Protection Panels.

Type GP panel is designed for use on grounded or resistance-grounded systems. Type GPA Panel is designed for ungrounded systems.

The following units are available:

3. SPECIFICATIONS

Maximum Ratings

TABLE 1: MAXIMUM RATINGS

GROUNDING SYSTEMS

CATALOGUE NUMBER	VOLTS (V)	MAX HP	MAX CURRENT (A)	SENSE (mA)
GP-2-20-5	208	20	60	5
GP-2-20-10	208	20	60	10
GP-2-35-5	208	35	85	5
GP-2-35-10	208	35	85	10
GP-4-40-5	480	40	60	5
GP-4-40-10	480	40	60	10
GP-4-75-5	480	75	85	5
GP-4-75-10	480	75	85	10
GP-6-50-5	600	50	60	5
GP-6-50-10	600	50	60	10
GP-6-90-5	600	90	85	5
GP-6-90-10	600	90	85	10

UNGROUNDDED SYSTEMS

CATALOGUE NUMBER	VOLTS (V)	MAX HP	MAX CURRENT (A)	SENSE (mA)
GPA-2-20-5	240	20	60	5
GPA-2-20-10	240	20	60	10
GPA-2-35-5	240	35	85	5
GPA-2-35-10	240	35	85	10
GPA-4-40-5	480	40	60	5
GPA-4-40-10	480	40	60	10
GPA-4-75-5	480	75	85	5
GPA-4-75-10	480	75	85	10
GPA-6-50-5	600	50	60	5
GPA-6-50-10	600	50	60	10
GPA-6-90-5	600	90	85	5
GPA-6-90-10	600	90	85	10

Accuracy: Pickup Levels accurate to 10%.

Time Delay as per Figure 6 Time/Current Characteristics.

Output Ratings:

- Contact 1 - Form A contacts 120V, 5A (Fused)
- Contact 2 - Form C contacts 120V, 5A (Fused)

Control Power Requirements

All panels are rated for nominal system Voltage $\pm 10\%$, 50 VA.

Note: Unit will operate to 55% of System Voltage, to comply with UL1053.

Dielectric Strength

System Terminals to chassis or low voltage circuits:

VHP = $(2 \times V_s) + 1000$ for 1 minute (VHP = Dielectric Voltage (V); V_s = System Voltage)

Output Terminals to chassis or other circuits:

VHP = 1800 V for 1 minute

Approval

CSA File LR65287

UL - File E107725 for Types GP

File E232710 for Types GPA

Note: UL recognized for 10 mA panels only.

GP/GPA panel enclosure type: NEMA 1

4. SENSITIVITY AND RATINGS

Each Pump Protection Panel is equipped with a ground current sensing device with either 5 or 10 milliampere trip level. The operating time at rated sensitivity depends on the ground current level. See Figure 6.

All current sensing devices operate on phase to ground current leakages on grounded or ungrounded systems.

The contact rating of the internal relay is standard pilot duty, 5 amps. at 120V AC, 60 Hz.

5. RECEIVING, HANDLING AND STORAGE

The panelboards are shipped in cartons designed to protect them against damage. Immediately upon receipt of the panelboard, examine it for any damage sustained in transit. If injury or damage resulting from rough handling is evident, file a damage claim at once with the transportation company and promptly notify I-Gard if replacement or renewal parts are required.

The panels should be installed when the construction is completed and the area of the panel location is at normal temperature and dryness.

6. INSTALLATION AND CONNECTIONS

The surface mounted factory prewired panels shall be installed as any other panels. Concentric knock-outs are provided on the bottom for incoming and outgoing cable connections.

The outline and mounting dimensions are shown on Figure 1.

The incoming and outgoing cables shall be connected to the line and load and the starter or contactor holding circuit to the control terminal block. Terminals for external alarm made as shown on Figure 2 for grounded and on Figure 3 for ungrounded systems. Note that the Trip Relay is normally energized in Normal (No fault) operation therefore NO contacts are in fact CLOSED and NC contacts are OPEN.

7. OPERATION

Because ground fault protection can be applied only on grounded systems, Pump Protection Panels (GPA) designed for ungrounded system contain a resistor type artificial neutral. This assures that the panel will trip on a single fault occurrence. The artificial neutral provides a maximum of approximately 50 mA fault current to flow into the ground fault, on short circuit.

The ground current sensing device, type BDD, in the Pump Protection Panels combines a differential current sensor and a solid state relay component in a totally encapsulated assembly which is completely resistant to vibration, dirt in normal temperature and humidity conditions.

The cables for the circuit being protected are passed through the window of the sensing device and when the current flow is normal, the magnetic flux created by the current in the cables, is exactly balanced, so that the net flux in the window is zero. When a leakage to ground occurs on the load side of the sensing unit, the vector sum of the conductor current is no longer zero, hence the magnetic field in the sensor's iron ring is not zero. This magnetic field generates a voltage output in the winding on the iron ring, proportional to the current unbalance, i.e. to the leakage current. This signal in the trigger element, when its level is equal to, or greater than, the calibrated level of the unit, turns on an SCR switch after a short time delay and activates the control relay, de-energising the contactor.

A TEST button and a ground fault indicator light is provided so that the circuit can be checked at any time to insure that it is in proper working order.

A RESET button is also provided.

8. TESTING AFTER INSTALLATION

Before energizing the feeder to the Pump Protection Panel, check that all connections are correctly made and that they are tight.

There should be no apparent result of applying power. If the red light comes on, check the circuit wiring for grounds.

When the panel is correctly wired, pressing the TEST button will cause the red lamp to light and the contactor to trip.

Pressing the RESET button will de-energize the control relay, extinguish the red light and the starter or contactor can be re-energized.

Note that, if an actual ground fault exists on the protected circuit, it will not be possible to reset the unit. Therefore, if the breaker trips and cannot be reset with the RESET button, check the protected circuit for a ground fault.

9. TESTING

The protection against lethal ground current depends on the correct operation of the protective device, therefore it is recommended that the circuit should be tested every day, and corrective maintenance should be performed not only on the components of the panel, but on the connected load devices and on the circuit wirings.

1. Pressing the TEST button should de-energize the control relay interrupting the holding circuit of the contactor and energize the red lamp, if
 - a. control relay drops out but red light is not on, check wiring connections and indicator lamp, if lamp is burnt-out, change bulb;
 - b. neither the lamp lights or the control relay drops out, check wiring connections, main and control fuses, if they are O.K., change control relay or change type BDD current sensor/ relay.
2. If system cannot be reset by the RESET button, check load and wiring for ground fault.
3. If the contactor can be re-energized after the panel is reset by the RESET button, check interconnecting wiring and holding circuit fuse.

10. SPARE PARTS

All major operating components of the Pump Protection Panels have an almost unlimited life expectancy. Most users wish to carry spares, in case of emergency, as a matter of policy.

It is recommended that component replacements, other than fuse, indicator lamp bulb and control relay changes and repairs should be done by Factory Service Man or qualified electrician.

Recommended spares are as follows:

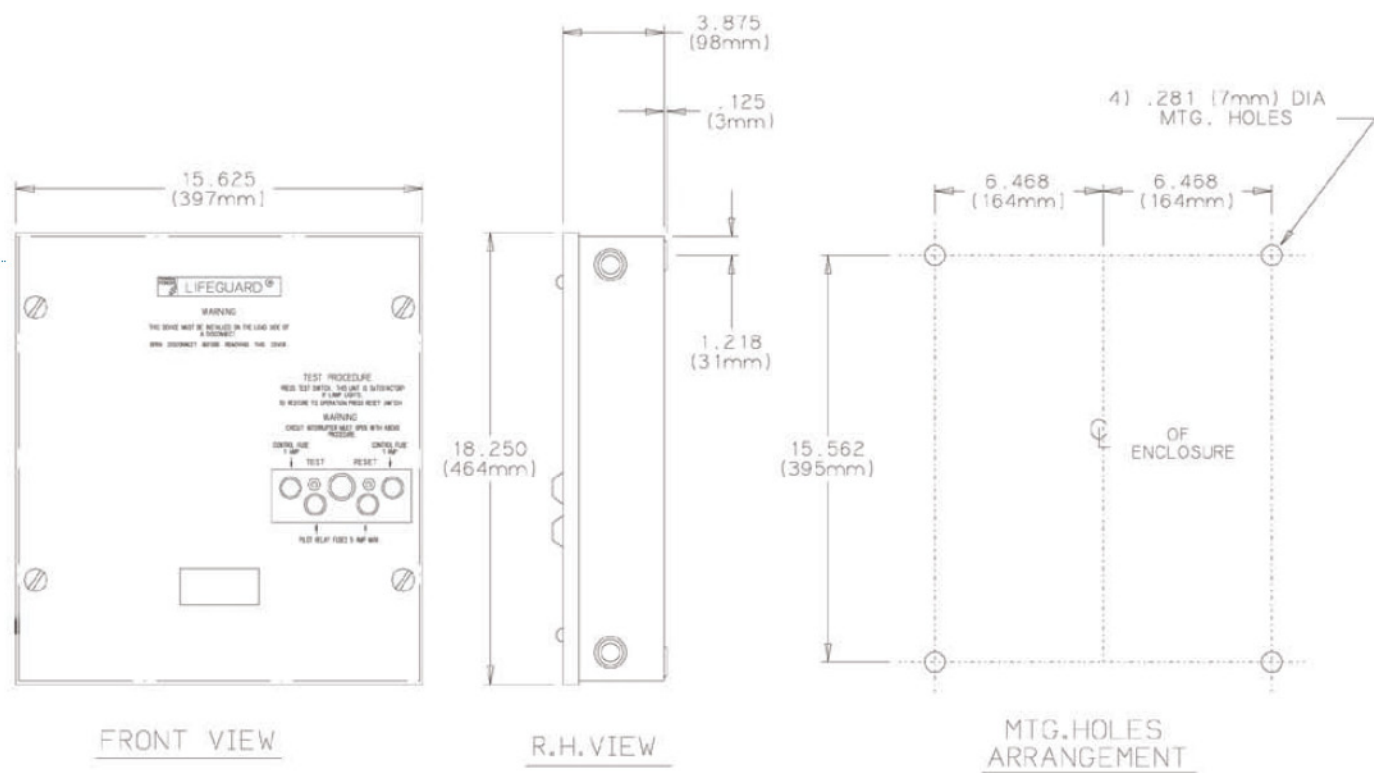
Main fuses - 3A	KTK-R-3
Control fuses - 1A	MDL-1
Control fuses - 5A	MTH-5
Rectifier	162-003X
Bulb	1819
Relay	KRPA14DY/12V
Test button, NO	8411K12
Reset button, NC	8411K7
Transformer,	
600/24V, 50VA	MH50AG
480/24V, 50VA	MH50CG
240/24V, 50VA	MH50MG
208/24V, 50VA	MH50WR
Main fuse holder	BC6033SQ
Control fuse holder	HKP
Red Indicator light	26-0410-1191-301
Resistor R1 -	100 ohms, 5%, 10W HL10/100
Resistor R2 -	75 ohms, 5%, 10W HL10/75
Artificial Neutral Resistors (R3, R4, R5)	
600V - 20K, 5%, 50W	HL50/20K
480V - 16K, 5%, 50W	HL50/16K
240V - 7.5K, 5%, 50W	HL25/7.5K
* Std. G.F. relay type BDD	164-039X-1 for 5mA
	164-039X-7 for 10mA

Repairs and component changes should be done as shown on the following typical wiring diagrams:

Fig. 4 Schematic & Wiring Diagram for GP (Grounded) Panels

Fig. 5 Schematic & Wiring Diagram for GPA (Ungrounded) Panels

Any order or enquiry re spares should be accompanied by complete part number and rating plate data, including serial number and should be sent to I-Gard .



NOTES:

1. THE PANEL IS FABRICATED FROM CODE GAUGE STEEL WITH ASA NO. 61, LIGHT GREY FINISH.
2. OPERATION INSTRUCTIONS ARE SILKSCREENED ON THE FRONT COVER.
3. THE PANEL IS AVAILABLE WITH 5mA OR 10mA SENSITIVITY (SUFFIX -5 OR -10).
4. THE ENCLOSURE HAS
 - A) 4 KO'S (TWO ON EACH SIDE) CONDUIT SIZE: 1.250 - 0.750 - 0.500.
 - B) 2 KO'S (ONE ON BOTH TOP AND BOTTOM) CONDUIT SIZE: 1.500 - 1.250 - 0.750 - 0.500.

Figure 1: Outline Dimensions

Typical Connection Diagram for Grounded System GP Series

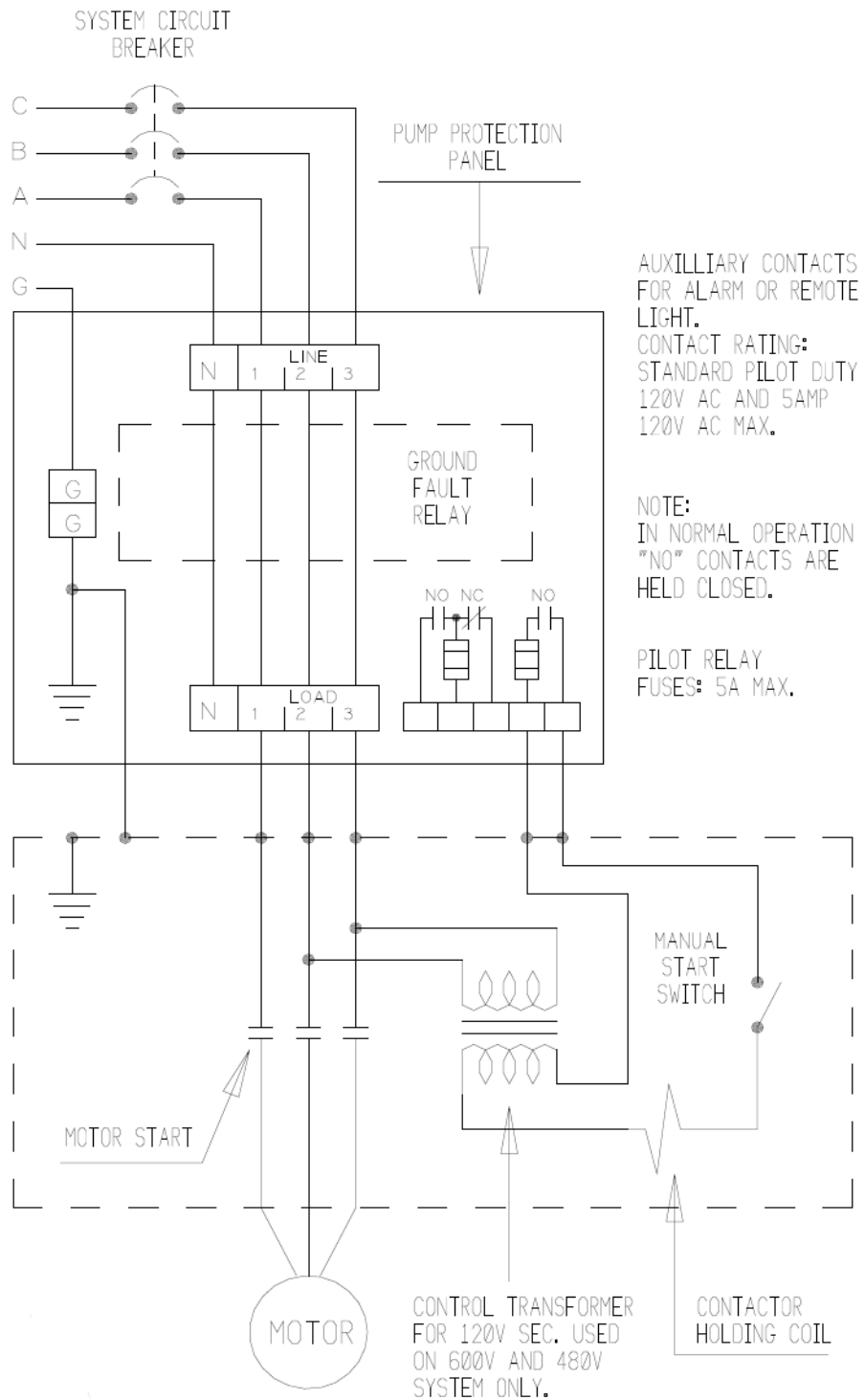


Figure 2: Connection Diagram (Grounded System)

Typical Connection Diagram for Ungrounded System GPA Series

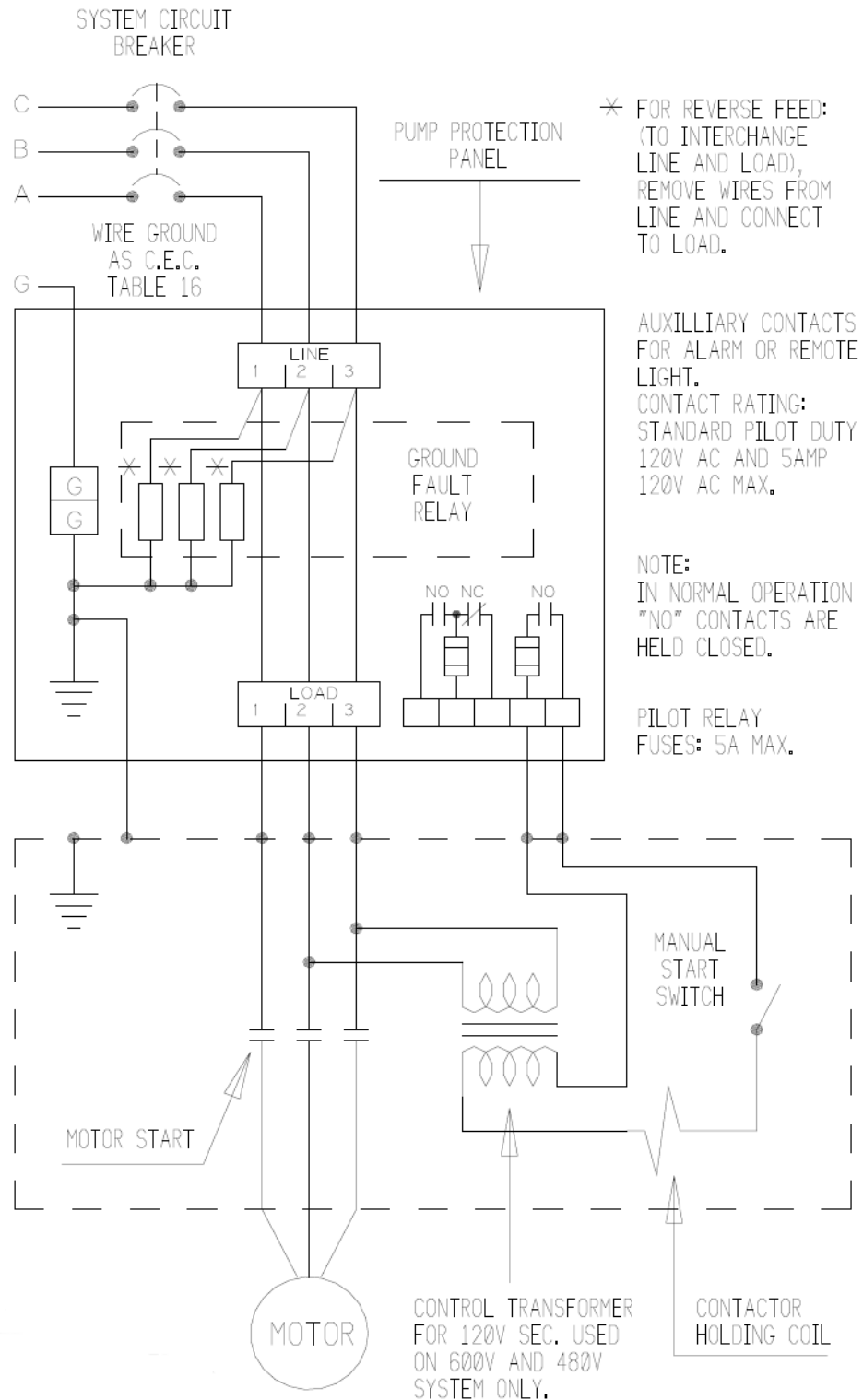


Figure 3: Connection Diagram (Ungrounded System)



Figure 4: Schematic and Wiring Diagram Grounded System Panels



Figure 5: Schematic and Wiring Diagram Ungrounded System Panels

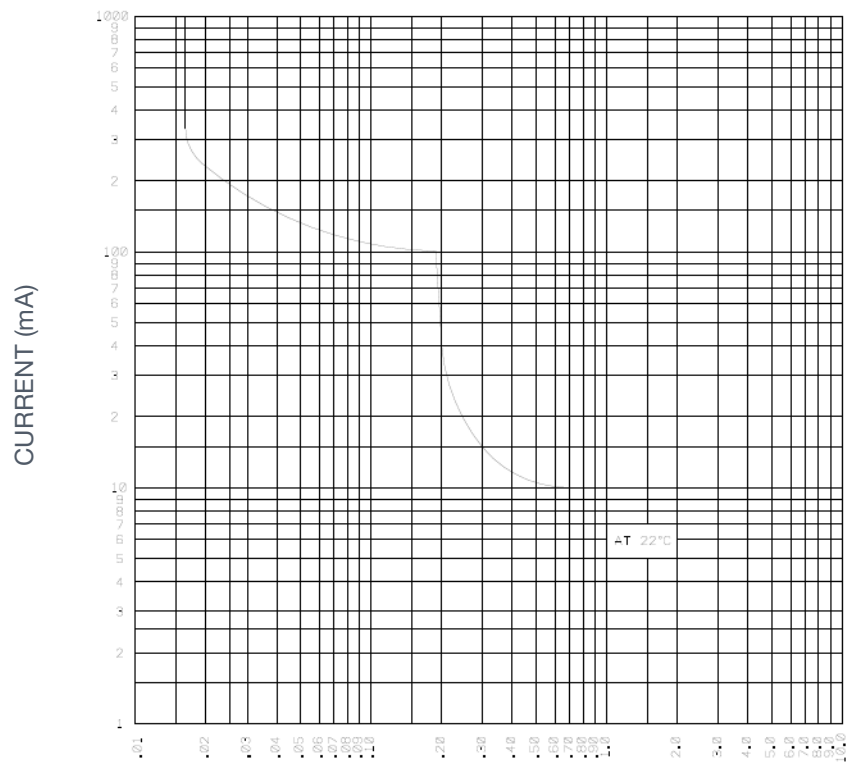


Figure 6: Time/Current Characteristics



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