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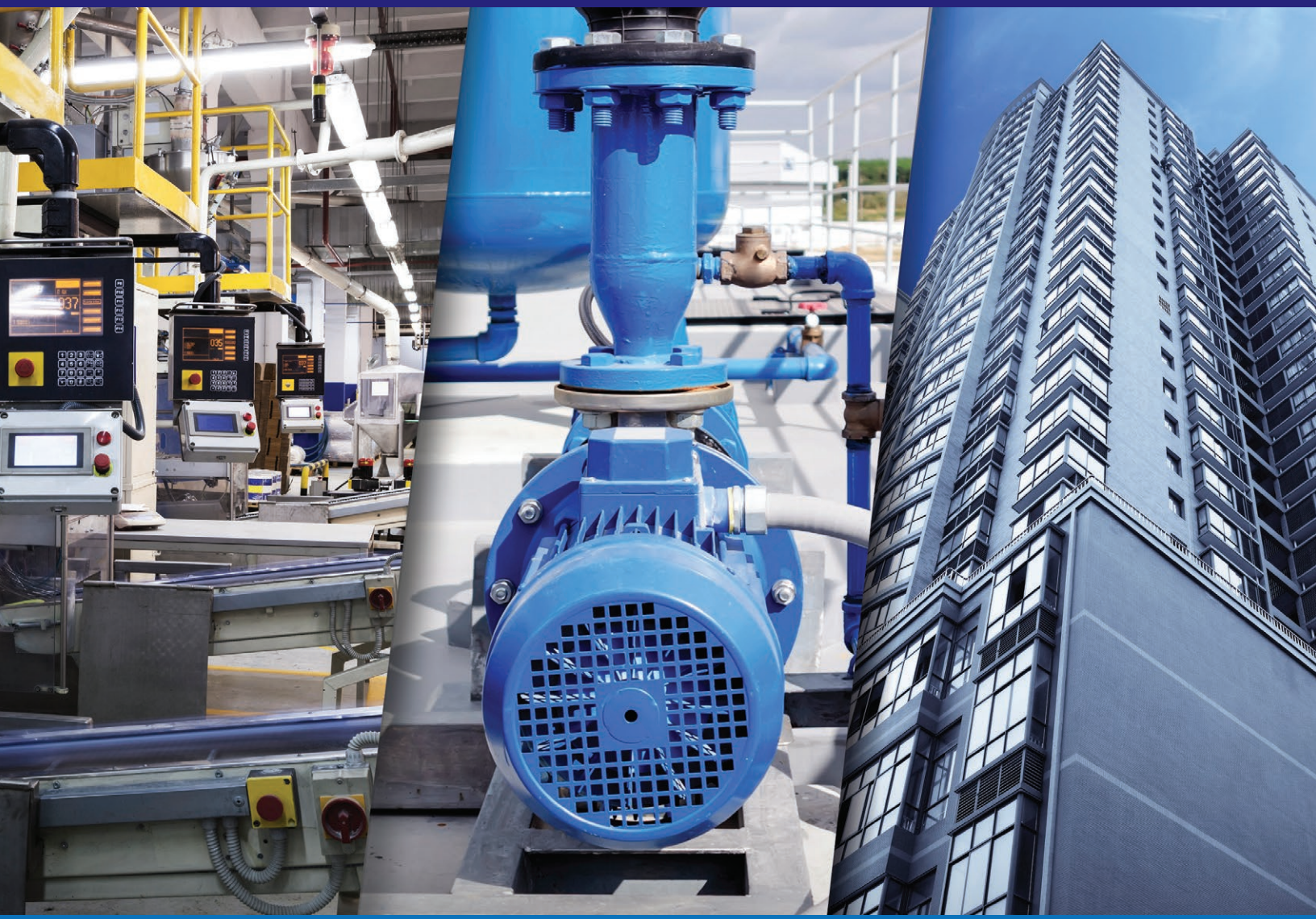
ELECTRONICS

LEADER IN TECHNOLOGY

Innovative Solutions for Control, Protection, and Automation.



Over 50 YEARS being the experts.

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NASSAR®
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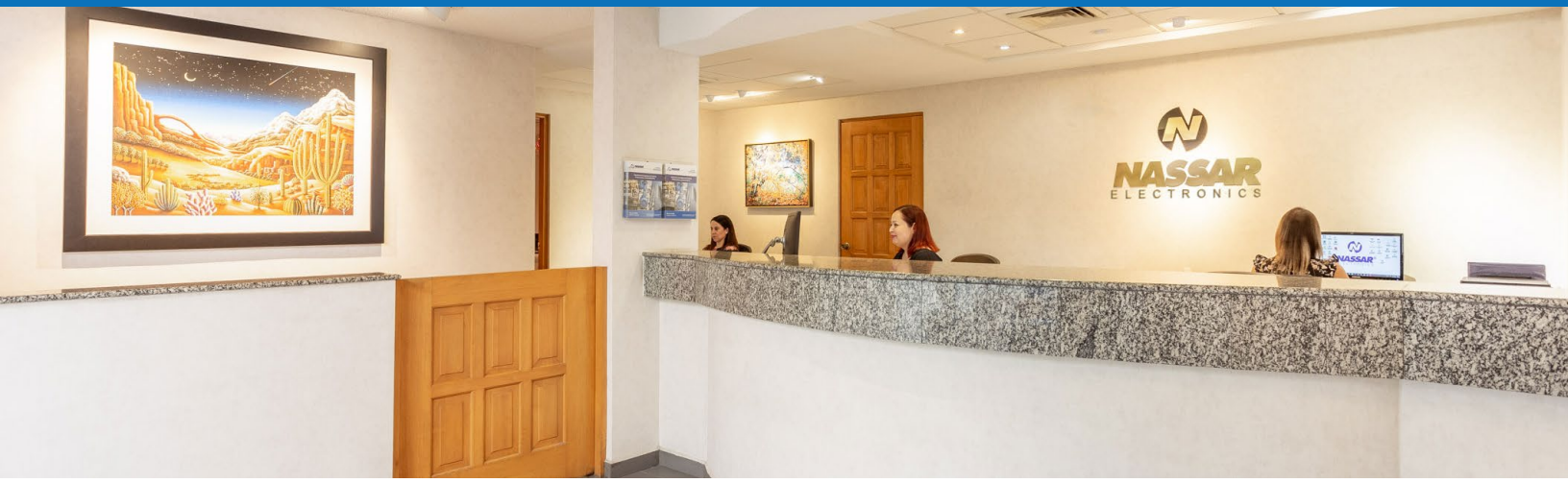
Líder en tecnología

Our products are exported to more than 25 countries across 5 continents.



WE ARE TECHNOLOGY LEADERS

Nassar Electronics is a proudly Mexican company, leading the manufacture of specialized electrical and electronic equipment.

Founded in 1973, **Nassar Electronics** has a presence in **over 25 countries across 5 continents**, where it has been recognized for the design and quality of its products.

WE ARE #1 IN INVENTORY FOR IMMEDIATE DELIVERY

We have the largest inventory in Mexico for **immediate delivery**, allowing us to ship most orders to any city in Mexico and the world in **less than 24 hours.**

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Index

EQUIPMENT AND ACCESSORIES

PANELS MODBUS AVAILABLE

Surge Arrester Series PD

They protect motors, equipment, and sensitive electronic systems against: Lightning, discharges, and voltage spikes. Discharge capacity up to 40kA.

- **Operating LED indicator for each line.**
- **Metal oxide varistor.**
- **Prevents damage to motors and equipment.**
- **Up to 40kA of discharge current capacity.**

DESCRIPTION:

The surge suppressors model PD-300 and PD-640 protect motors and equipment, both single-phase and three-phase, against voltage spikes (transient overvoltages) and electrical discharges in the lines caused by lightning, disconnection of large inductive loads, and cyclic motor startups.

These voltage spikes often reach the order of thousands of volts and only occur for a fraction of a second.

However, they are enough to damage the insulation of the motors or the electronic equipment connected to the lines.

The PD series surge protectors have internal thermal protection to prevent damage inside the panel when the discharge exceeds the protection capacity. This capacity can be increased by installing several protectors in parallel.

OPERATION:

When a discharge occurs, the protector absorbs it or sends it to ground, thus preventing voltage spikes from rising to a level that could damage connected devices.

The PD series protectors come with operating indicators that show the protector is in good condition and providing protection. If any indicator is off, it means that line received a discharge exceeding the protector's capacity and damaged it, leaving that line unprotected.

TECHNICAL SPECIFICATIONS:

MODELS	PD-300	PD-640
AC voltage range	120/220 VAC	220/440 VAC
Maximum line current	40,000 amp.	40,000 amp.
Maximum energy in Joules	1,300	3,900
Frequency	50/60 Hz	
Operating temperature	-4 to 158° F	
Weight with packaging	15.16 oz.	
Dimensions	Figure #1 (See appendix p. 32)	
Warranty	One year	

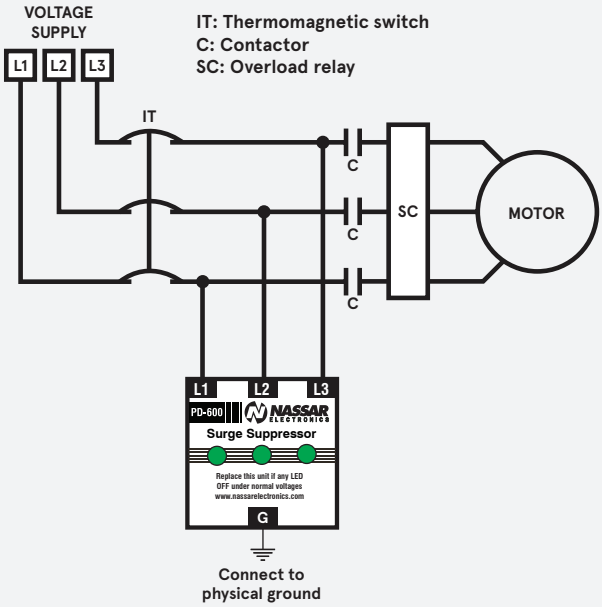
TO ORDER:

TYPE	VOLTAGE	CAPACITY	MODEL
Single-phase	120/220 VAC	40 kA	PD-300
Three-phase	220/440 VAC	40 kA	PD-640

* For DIN rail mounting, order the DIN-3 adapter plate

CONNECTION EXAMPLE:

For more installation information, please refer to the instruction manual.



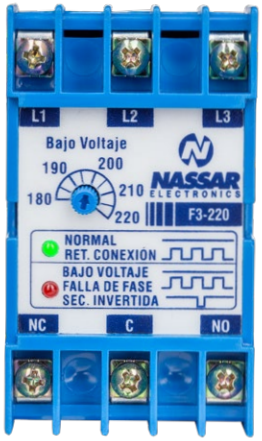
FaseAlert-3® Three Phase Voltage Monitor Relay

Protects motors and equipment against phase failure, unbalance, reversal, high and low voltage.

- **Prevents damage to motors and equipment.**
- **Used for motors from 1 to 300 H.P.**
- **Very easy to install.**
- **Certified by UL of Mexico SA de CV**

UL MX -NOM | 5 YEAR WARRANTY

F3D



F3

F3P

DESCRIPTION:

The FaseAlert-3 is a highly reliable device, manufactured with cutting-edge technology; it has LEDs to clearly indicate its operation and failures. The F3D model features an illuminated LCD screen that displays: The 3 line voltages, failures, settings, and operating indications. Furthermore, it retains a permanent memory of the most recent failure and keeps a log of the highest and lowest voltages. This enables you to track the history of failures and voltage fluctuations that occur in your absence.

Furthermore, it has a connection for the DL-100 voltage recorder, which stores voltages and failures of the three-phase supply in memory. The data can be easily transferred to a computer through USB, allowing for convenient graphical representation and visualization of the information.

In the FaseAlert-3, both the operational delays, high and low voltage, as well as voltage unbalance can be adjusted.

OPERATION:

The FaseAlert-3 protects by disconnecting the contactor coil and shutting off the motor when it detects a voltage fault. It does this through an internal contact that opens or closes according to the voltage conditions.

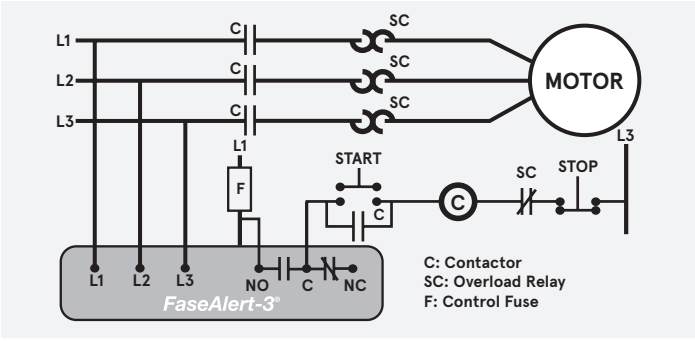
It has a programmed delay to avoid disconnecting the motor due to short-duration faults that don't affect it. When normal voltages return, there can be an adjustable delay before reconnecting. This is necessary for some equipment like refrigeration compressors.

TECHNICAL SPECIFICATIONS:

MODELS	F3	F3P	F3D
Disconnect delay	5 seg.	0-10 seg.	0-10 seg.
Reconnection delay	0	0-10 min.	0-10 min.
Voltage unbalance	5%	5%	3-10%
Operating temperature	14 to 140°F	14 to 140°F	14 to 122°F
Weight with packaging	12.69 oz.	12.69 oz	12.69 oz
Dimensions (See annex p. 32)	Figure #1	Figure #1	Figure #2
Contact	SPDT 10 Amp. 220 V, 3 Amp. 440 V		
Contact lifespan	100,000 operations at nominal capacity		
Operating frequency	50/60 Hz.		
Consumption	3 Watts aprox.		

CONNECTION EXAMPLE:

For more installation information, please refer to the instruction manual.



VOLTAGE RANGES FOR ALL MODELS:

NOMINAL VOLTAGE	120 V	220 V	380 V	440 V
Maximum voltage	150 V	270 V	470 V	540 V
Low voltage adjustment	90-120 V	180-220 V	300-380 V	360-440 V
High voltage adjustment	120-150 V	230-270 V	390-470 V	460-540 V

MODEL COMPARISON

	Standard F3	PLUS F3P	DIGITAL F3D
Low voltage protection	▪	▪	▪
Phase failure protection	▪	▪	▪
Unbalance protection	▪	▪	▪
Reverse rotation protection	▪	▪	▪
Fault indication for each type	▪	▪	▪
Automatic reset after fault	▪	▪	▪
High voltage protection		▪	▪
Adjustable delays		▪	▪
Individual fault indication		▪	▪
Manual reset after fault			▪
Unbalance adjustment			▪
Illuminated LCD screen			▪
Voltage indication			▪
Max. V and Min. V memory			▪
Data logger connection			▪
Fault memory			▪
Accuracy at 77°F	2 %	2%	1.5%
Warranty	3 years	3 years	5 years

TO ORDER:

THREE-PHASE MODELS

NOMINAL VOLTAGE	F3 STANDARD	F3P PLUS	F3D DIGITAL
220 V	F3-220	F3P-220	F3D-220
380 V	F3-380	F3P-380	F3D-380/440
440 V	F3-440	F3P-440	F3D-380/440

* For DIN rail mounting, order the DIN-3 adapter plate

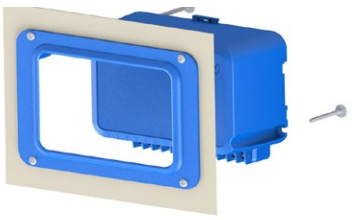
SINGLE-PHASE MODELS

NOMINAL VOLTAGE	F2P PLUS
120 VAC	F2P-120
220 VAC	F2P-220

NEW ACCESSORIES FOR THE F3D:

DL-100:

A data logger that stores the three-phase voltages and faults on a USB memory for up to 20 days. The information can be viewed graphically on a computer or in Excel tables.



PMF-237:

Adapter plate for mounting on the panel door to easily view voltage, faults, and configure settings.

3-Phase Voltage Data Logger Datalogger DL-100

5 YEAR WARRANTY

Stores voltages and voltage failures for graphical display on a computer.

- **Logs triphasic line voltages and failures.**
- **Up to 20 days of continuous monitoring.**
- **Software included for easy visualization.**

DESCRIPTION:

The DL-100 Datalogger is an accessory for the Fasealert-3 Digital that stores the voltages and failures of the triphasic power supply in memory.

This data is fed to a computer via USB to be analyzed with the Nassar Data View software that comes included.

The information stored in memory can be viewed from any computer to analyze the voltage history.

The memory has the capacity to save information for an entire year. Voltages are obtained from a Fasealert-3 Digital, so it is necessary to have both devices to be able to record the data.

OPERATION:

When connecting the DL-100 to the F3D, the device automatically turns on, and the STATUS indicator will flash every 10 seconds when storing voltages in memory.

The DL-100 can last from 30 to 40 days operating; the low battery indicator will notify you when it's necessary to change batteries to continue logging the voltages.

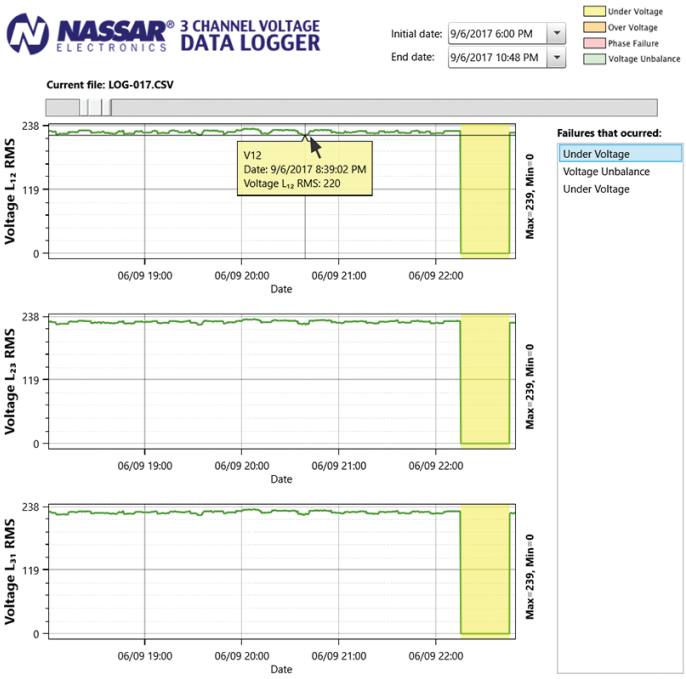
To view the data, simply remove the memory and insert it into a computer, where you can see the voltages and failures that occurred graphically with the included software. Alternatively, they can also be viewed using Excel or any spreadsheet software.

TECHNICAL SPECIFICATIONS:

Memory capacity	4 GB (1 year of readings)
Readings	6 readings per minute
Battery type	2 Alkaline AA batteries. (Not included)
Battery life	30-40 days with 1500 mAh batteries.
Cable length	19.68 in.
Dimensions	4.7 length, 2.75 width, 1.8 height in.
Weight	6.3 oz.
Operating temp.	32 to 122 °F

EXAMPLE OF DATALOGGER DL-100 SCREEN:

For more information, please refer to the instruction manual.



Pump-Monitor® 3 Phase Motor & Pump Protection Relay

Protection of motors and pumps against overload,underload, phase failure, dry-running, and rapid cycling.

- **Used in motors from 1 to 300A in 220 and 440V.**
- **The LCD screen displays: The three-phase currents, maximum current, failures, and allows adjustments.**
- **Protects pumps against dry-running without the need for level probes.**
- **Memory of the last ten faults.**
- **Certified by UL of Mexico SA de CV.**
- **Includes current transformers.**

New presentation subject to availability.

DESCRIPTION:

The PM-3 is a innovative protection for three-phase motors and pumps, with many advantages over standard bimetallic overload relays. It has an illuminated LCD screen that displays Three-phase current flow,maximum current, and the last ten failures stored in memory.

It has a settings menu to configure it according to each need.

Protects pumps against dry-running by detecting low current, without the need for level probes.

It includes a test button for simulating faults and an LED indicator to show operational status of the relay.

OPERATION:

When current values are normal, the "A" contact remains closed and the LED is on. When there is a fault, the disconnect delay countdown begins. After the time has elapsed, it opens the "A" contact and turns off the motor.

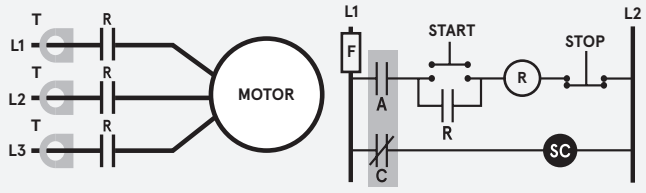
Reconnection after a fault can be manual or automatic.

TECHNICAL SPECIFICATIONS:

Low-load setting	From 0 to 90% of the nominal current.
Rapid cycling cut-off	Approximately 4 starts per minute.
Connection delay	Adjustable from 5 to 120 minutes.
Disconnect delay	For overload class 5, 10, 15. Adjustable for overload: 16 to 200 sec. For phase failure: 3 seconds For low load: 5 seconds
Supply voltage	220/440* V ± 15%, 50/60 Hz.
Accuracy	2.5% at 50% of the maximum current.
Contact capacity	8 Amp. at 220 V 1 NO and 1 NC.
Operating temperature	14° to 122°F.
Consumption	Approx. 3 watts.
Packaged weight	PM31: 17.637 oz. / PM32: 52.91 oz.
Dimensions	Figure #2 (See appendix p. 32)

CONNECTION EXAMPLE:

For more installation information, please refer to the instruction manual.



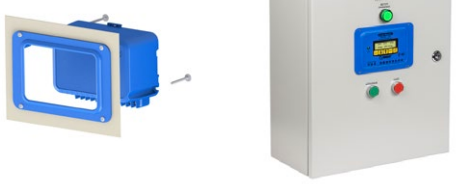
A: Normally open contact of the PM-3
C: Normally closed contact of the PM-3
F: Control fuse
T: Current transformers
R: Contactor
SC: Optional fault indicator pilot

TO ORDER:

MODEL	CAPACITY
PM-31	2 to 80 Amp.
PM-32	81 to 300 Amp.

Includes a current transformer.

FRONT MOUNTING PLATE:



PMF-237: Adapter plate for door mounting in panels to visually display the current, faults, and handle the equipment with ease.

Pump-Monitor® Single Phase Motor & Pump Protection Relay

UL MX -NOM | 3 YEAR WARRANTY

Protects pumps against overload, underload, low voltage, high voltage, dry-running and rapid cycling.

- **For motors from 1/2 to 20 H.P.**
- **Self-calibrating or manually adjustable.**
- **With an LCD screen that displays voltage, current, and power.**
- **Protects pumps against dry-running without the need for level probes.**
- **Fault memory.**

DESCRIPTION:

The Pump Monitor is an innovative device specially designed for the protection of single-phase pumps. It eliminates the need for contactors, overload relays, float switches, and high/low voltage protection

It protects the pump from overload, low voltage, rapid cycling, and dry-running without the need for level probes. It measures the pump's power to determine when it is out of water.

The Pump Monitor is self-calibrating, meaning it calibrates itself, but it can also be manually adjusted if desired. It features an LCD screen to display the voltage, current, power in watts, faults, etc. It has a memory to indicate faults that occurred when you weren't present.

TECHNICAL SPECIFICATIONS:

Supply Voltage	120 V or 220 V, 50/60 Hz.
Contact Capacity	15 amp. max. 1.5 HP at 220 V from 16 to 60 Amp. using an external contactor
Connection Delay	Adjustable from 0 to 120 minutes.
Disconnection Delay	For overload For high/low voltage and low load: 5 sec For rapid cycling: 1 sec.
Operating Temperature	14° to 140° F
Consumption	3 watts max.
Weight with packaging	11.28 oz
Dimensions	Figure #2 (See appendix p. 32)

TO ORDER:

MODEL	VOLTAGE	CAPACITY
PM-22	120/220 V	4 to 15 amp.
PM-23*	220 V	16 to 60 amp.

* Includes the current transformer.

FRONT MOUNTING PLATE:

PMF-237: Adapter plate for panel door mounting to easily view current, voltage, power, faults, and operate the equipment.

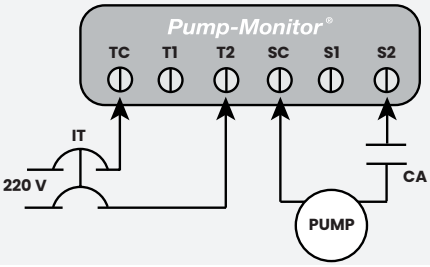
OPERATION:

When there's an overload, high or low voltage, rapid cycling, or if the pump runs out of water, the Pump Monitor protects it by disconnecting it.

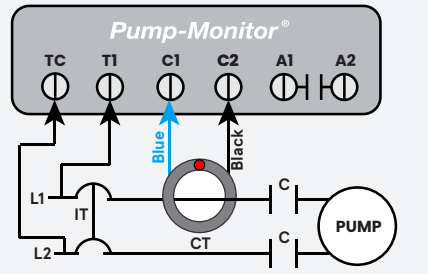
It has a delay to avoid disconnecting due to short-duration faults that do not affect the pump. If the pump starts more than four times in a minute, it disconnects due to rapid cycling to prevent overheating or damage.

After the fault has been corrected, the pump can be manually connected by pressing the RESET button or automatically after the adjusted disconnection delay.

EXAMPLE CONNECTION PM22 15 AMP.



EXAMPLE CONNECTION PM23 60 AMP.



For more installation information, please consult the manual.

Seal Leakage and Over Temperature Relay DFS-12

UL MX -NOM 3 YEAR WARRANTY

Leak detector in the seal and high temperature, for the protection of submersible pumps.

- Used in motors from 1 to 300 H.P.
- Has fault memory.
- SPDT relay, 10 amps.
- Certified by UL of Mexico SA de CV.

DESCRIPTION:

The DFS-12 detects seal failure in submersible pumps equipped with these sensors. When water enters the seal and mixes with the oil, moisture can be detected by the insulation level. If the leak is not detected in time, moisture can cause an insulation failure in the pump, burning it out.

The DFS-12 also detects excessive heating of the pump through the temperature sensor and disconnects the pump to protect it from overheating or damage.

OPERATION:

When the DFS-12 detects an issue, it opens its internal contact and turns off the pump. A fault indicator LED lights up.

The reset can be set to be either manual or automatic. It has a fault memory that keeps the fault LED flashing until the memory is manually cleared.

TECHNICAL SPECIFICATIONS:

Supply voltage	120 or 220 VAC ± 10% 50/60 Hz.
Contact capacity	10 amp. 220 VAC 3 amp. at 440 VAC.
Contact lifespan	200,000 operations at full load.
Voltage between E1 and E2	24V VDC.
Detection level between E1 and E2	Adjustable from 5K to 100K ohms.
Detection level between H1 and H2	10 Ohms or less.
Current in E1 and E2	1 mA. AC maximum.
Operating temperature	From 14 to 140°F.
Consumption	3 watts aprox.
Weight with packaging	14.81 oz.
Dimensions	Figure #1 (See annex p. 32)
Warranty	3 years.

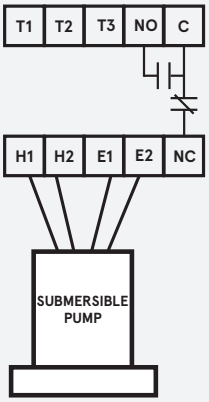
TO ORDER:

MODEL	VOLTAGE
DFS-12	120/220 VAC

*** For DIN rail mounting, order the DIN-3 adapter plate.**

CONNECTION EXAMPLE:

For more installation information, consult the manual.



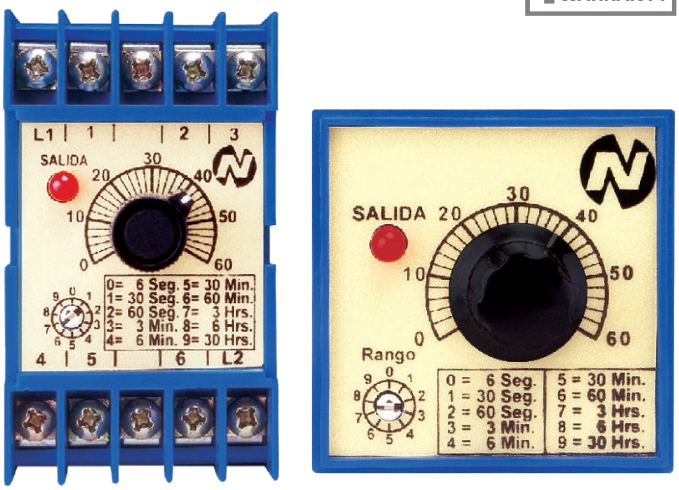
T1, T2, and T3: Supply
NO, C, and NC: Contacts
E1 and E2: Leak detector
H1 and H2: High temperature detector

Time Delay Relays

1 YEAR WARRANTY

0.1 sec. to 30 hours

- Operates from 90 to 250 VAC.
- DPDT relay of 8 amp.
- 2% accuracy
- Plug-in mounting, DIN rail, and screw mounting



DESCRIPTION:

All models can be powered with voltages from 90 to 250 V. Mounting can be plug-in, screw mounted, or DIN rail. They have range and operation time adjustments.

Standard relays are on-delay, but there is a wide range of operations and special voltages to meet any need.

OPERATION:

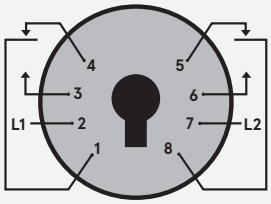
When the relay is connected, the LED blinks and starts counting time. Once the pre-set time has elapsed, the internal relay energizes and the LED stays on.

When the relay is disconnected and reconnected, the timer will start counting again.

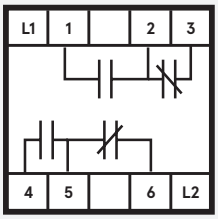
CONNECTION EXAMPLE:

For more installation information, please refer to the manual.

Model RTE



Model RT



TECHNICAL SPECIFICATIONS:

Power supply voltage	De 90 to 250 VAC. 50/60 Hz.
Contact capacity	DPDT 8 amp. 250 VAC resistive.
Mechanical life:	10 million operations.
Setting accuracy	1.5% in 10 ranges and 3% in 5 ranges.
Repeatability	0.1%
Operating temperature	14 to 140°F
Reset time	90 mseg.
Dimensions/Weight RT model	Figure #1/8.81 oz. (See annex p. 32)
Dimensions/Weight RTE model	Figure #3/8.81 oz. (See annex p. 32)
Warranty	One year

TO ORDER:

MODEL	RANGES	MOUNTING
RTE-5	5	Plug-in
RT-5	5	Screw mounting or DIN rail
6 seg., 60 seg., 6 min., 60 min., 6 hrs.		

MODEL	RANGES	MOUNTING
RTE-10	10	Plug-in
RT-10	10	Screw mounting or DIN rail
6 seg., 30 seg., 60 seg., 3 min., 6 min., 30 min., 60 min., 3 hrs., 6 hrs., 30 hrs.		

* For DIN rail mounting, order the DIN-3 adapter plate.

PS-100 7-Day Programmable Digital Timer

Save energy. Automatically turns devices on and off at the programmed time and day.

- **Illuminated LCD screen.**
- **Easy to program.**
- **Precision clock with a backup battery that lasts up to 10 years.**
- **Operates from 100 to 250 VAC.**
- **Certified by UL of México SA de CV.**

DESCRIPTION:

The PS-100 can be easily programmed to control the activation and deactivation of equipment and motors on any day of the week at the assigned hour and minute. Up to 20 activation and deactivation events can be scheduled.

In the event of a power outage, the clock retains the time for up to 10 years with a single included lithium battery, and the programmed events remain intact as they are stored in permanent memory.

All models of these programmable timers operate with either 120V or 220V and are equipped for daylight saving time adjustments.

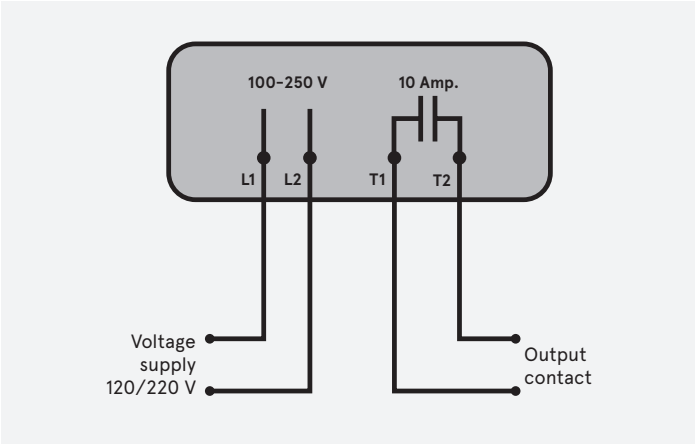
OPERATION:

The timer automatically turns devices on or off at the programmed time and day. Regardless of this, the device can be manually turned on or off at any time.

Every time the time switch connects the device, the LED lights up.

CONNECTION EXAMPLE:

For more installation information, please refer to the manual.



TECHNICAL SPECIFICATIONS:

Supply voltage	From 100 to 250 VAC 50/60 Hz.
Contact capacity	10 amp. resistive at 220 V max.
Full load lifespan	500,000 operations
Program memory	PS-100: 20 events
Precision	± 2 sec. per day at 77° F.
Consumption	3 watts max.
Lithium battery lifespan	Approx. 10 years at 77° F.
Operating temperature	14 to 140° F.
Weight with packaging	11.28 oz.
Dimensions	Figure #2 (See annex p. 32)

TO ORDER:

MODEL	MOUNTING TYPE	TYPE
PS-100	For screw mounting / DIN Rail	On-Off

FRONT MOUNTING PLATE

PMF-237: Adaptor plate for mounting on the door of panels to easily view the time and operate the device.

Ammeters and Voltmeters with Frequency Meter

UL MX - NOM | 3 YEAR WARRANTY

For alternating current, for use in panels.

- Excellent accuracy of 0.5%.
- RMS value readings.
- Recording of maximum and minimum values.
- For panel mounting.
- Frequency meter integrated into the voltmeters.
- Single-phase and Three-phase models available.

AMPERIMETERS

THREE-PHASE 80 A MODEL AD3-80

Maximum amperage recording. Includes the 3 high-precision current transformers necessary for measurement."

THREE-PHASE 400 A MODEL AD3-400

Maximum amperage recording. Includes the 3 high precision current transformers required for measurement.

THREE-PHASE MULTI-RANGE MODEL AD3-5000

Can be configured and used in the following current scales in ampere: 200, 300, 400, 500, 600, 800, 1000, 2000, 3000, and 5000 A. Maximum amperage recording. The 3 current transformers with a 5A output required for measurement are not included.

SINGLE-PHASE 80 A MODEL AD1-80

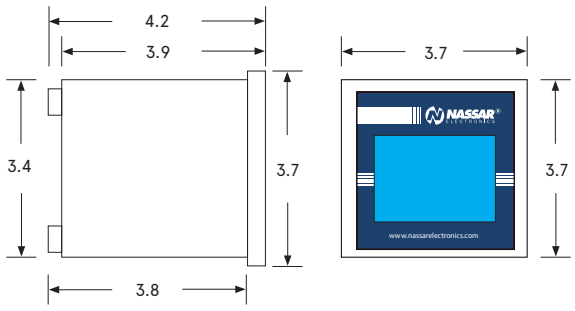
Maximum amperage recording. Includes the high precision current transformer required for measurement.

SINGLE-PHASE MULTI-RANGE MODEL AD1-5000

Can be configured and used in the following current scales in amperes: 200, 300, 400, 500, 600, 800, 1000, 2000, 3000, and 5000 A. Maximum amperage recording. The current transformer with a 5A output required for measurement is not included.

FIGURE

Inches



VOLTMETERS

THREE-PHASE MODEL VD3-500

- Scale 0-500 VAC.
- Integrated frequency meter.
- Maximum voltage recording.
- Minimum voltage recording.
- Power supply voltage 220/440 VAC.
- Output for voltage recorder/plotter with the Datalogger DL-100 (Sold separately).

SINGLE-PHASE MODEL VD1-500

- Scale 0-500 VAC.
- Integrated frequency meter.
- Maximum voltage recording.
- Minimum voltage recording.
- Power supply voltage 120/220 VAC.

GENERAL SPECIFICATIONS FOR ALL INSTRUMENTS

Voltmeter Accuracy	0.5% ±1 dígit @ 77 °F
Ammeter Accuracy	0.9% ±3 dígit @ 77°F
Reading Frequency	40-70 Hz
Operating Temperature	14 to 140 °F
Power Supply Voltage	120/220 VAC (220/440 for the VD3-500)
Weight	11.28 oz.
Consumption	2.5 Watts.
Dimensions	Figure #4 (See annex p. 32)

Liquid Level Control Relay

For water level control and pump protection against dry-running.

- Controls and indicates water levels
- For single-phase and three-phase pumps from 1/4 to 300 H.P.
- Operates pumps up to 1.5 H.P. without a contactor.
- AC output, prevents scale buildup.
- All models operate at 120/220 V.
- Certified by UL de México SA de CV.

DESCRIPTION:

The liquid level control relays automatically control the pump's operation with their internal contact and include LEDs that indicate: the water level in the tank, the pump's operation, when the pump is dry-running.

The EN-3P is used to keep a tank full or empty and also to protect pumps from dry-running. It has sensitivity adjustment from 5k ohms to 100k ohms. This sets the level at which the relay determines whether liquid is present at the probe or not.

The VL-2 is used to control the level of two tanks; it fills one tank while protecting the other from dry-running.

OPERATION:

The water level sensors detect the liquid level through the electrical contact of the level probes in the water and operate the contacts to turn the pump on or off depending on the level in the tank.

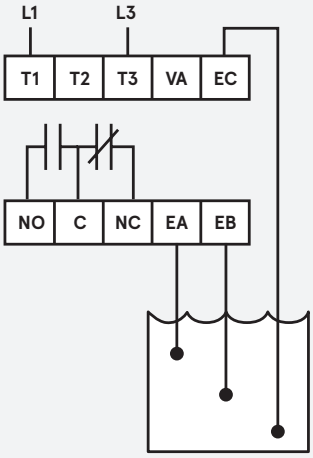
They have LEDs that indicate: The supply voltage, pump operation, and water levels.

TECHNICAL SPECIFICATIONS:

Power Voltage	120/220 VAC., 50/60 Hz.
Contact Capacity	NO 12 amp. NC 8 amp. 1.5 HP at 220 V
Service Life at Full Load	200,000 operations.
Liquid Resistance	50K Ω max.
Probe Voltage	18 VAC max.
Consumption	3 Watts max.
Probe Cable Length	550 yards max (5,500 yards available upon request)
Operating Temperature	14 to 122°F.
Dimensions	Figure #1 (See appendix p. 32)
Weight with packaging	13.75 oz.

CONNECTION DIAGRAM:

For more installation information, please refer to the instructions.



TO ORDER

MODEL	DESCRIPTION
EN-3P	For one tank
VL-2	For two tanks (Rooftop tank-cistern)

OPTIONAL EQUIPMENT

MODEL	DESCRIPTION
E-3	Set of 3 bronze level probes
DIN-3	Mounting plate for DIN rail

Alternators, Simultaneous Controllers

For pumps.

- Saves energy.
- Enhances system reliability.
- Controls the operation of 2, 3, and 4 pumps.
- "Skip" function for maintenance pumps.
- Certified by UL of México SA de CV.

1 YEAR WARRANTY

UL MX -NOM

DESCRIPTION:

Splitting the workload among multiple pumps instead of using a single one conserves energy. This approach not only allows these pumps to operate more efficiently but also enhances the system's reliability by not relying on a single pump.

Alternators serve to distribute the pump's workload, ensuring uniform wear and, in the event of a failure or increased demand, automatically starting 2, 3, or 4 pumps simultaneously.

OPERATION:

Each time terminals TC and A are closed, the pumps start alternately. If terminals TC and S are also closed, both pumps start simultaneously. Pumps stop when contacts across all terminals are open.

Every time a pump starts, it is indicated on the alternator by the lighting of the corresponding LED.

For two-pump alternators, one terminal is used to alternate and another to operate simultaneously. For 3 and 4 pump alternators, one terminal is used to alternate and 3 to operate simultaneously.

TECHNICAL SPECIFICATIONS:

Supply voltage	120/220 VAC. ±10% 50/60 Hz.
Contact capacity	10 amp. at 220 VAC resistive load.
Contact life expectancy	200,000 operations at full load.
Control terminal voltage	24 VDC
Input detection level	50 Kohms max.
Operating temperature	14 to 140° F
Power consumption	Approx. 3 watts.
Weight/dimensions AS2	14.10 oz. / Figure #1 (See annex p.32)
Weight/dimensions AS34	24.69 oz. / Figure #2 (See annex p.32)

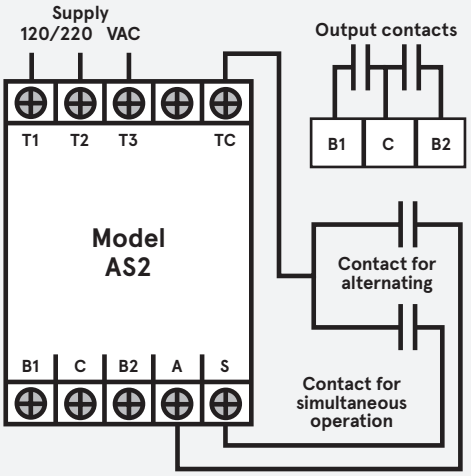
TO ORDER:

MODEL	NUMBER OF PUMPS
AS2*	For 2 pumps
AS34	For 3 or 4 pumps

*** For DIN rail mounting, order the DIN-3 adapter plate.**

CONNECTION DIAGRAM:

For more installation information, please refer to the nstructions.



NEW AS34 ACCESSORY:

PMF-237: Adapter plate for mounting on panel doors for easy viewing of indicators and equipment operation.

Accessories and Spare Parts

CONTROL TRANSFORMERS

Used to raise or lower control voltages in any combination of: 120, 220, or 440 V.

MODEL	TR-50	TR-100	TR-200
CAPACITY	50 VA	100 VA	200 VA

SET OF 3 PROBES WITH PLASTIC COVERS

Used for electronic level controls, these level probes come into contact with the water to detect its level. They have a plastic cover to prevent false contacts in metal containers or well casing.

Model: E-3

MERCURY FLOAT SWITCH

Normally open mercury contact that closes when the liquid reaches the set level.

Cable length: 23 ft. (7m)
Capacity: 2 Amp at 120/240 VAC.
Lifetime: 10 million operation cycles.

Model: DN-1

PRESSURE SWITCH

Normal open and closed contacts that operate at the adjusted pressure, with a dial for easy pressure adjustment.

MODEL	IS-6	IS-10
CAPACITY	87 Psi. (5.6kg.)	10kg (147 Psi.)

MECHANICAL FLOAT SWITCH

Mechanical normally open and closed contact that closes when the liquid reaches the set level.

Cable length: 23 ft. (7m)
Capacity: 16 Amp at 120 V
and 5 Amp at 240 VAC.
Lifetime: 10,000 operation cycles.

Model: DN-2

DIN RAIL MOUNTING ADAPTER PLATE

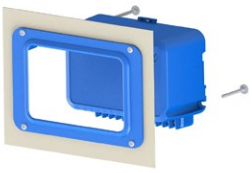
Used to mount devices on DIN rail, making installation and maintenance easier without the need for screws.

Model: DIN3

PRESSURE SENSORS OUTPUT 4-20 MA

Pressure transducer with an output of 4-20 milliamps.
With a 1/4 NPT connection.
Powered by 10 to 30 VDC.

MODEL	SP-200
PRESSURE	0 to 200 Psi



FRONT-MOUNT ADAPTER PLATE FOR CONTROL PANELS

Positions the devices visibly to easily view voltage, current, power, faults, alarms, and more information on the screen.

Model: PMF-237

Reduced Voltage Autotransformer Starter Panel

NEMA 4 | 1 YEAR WARRANTY

Model TX

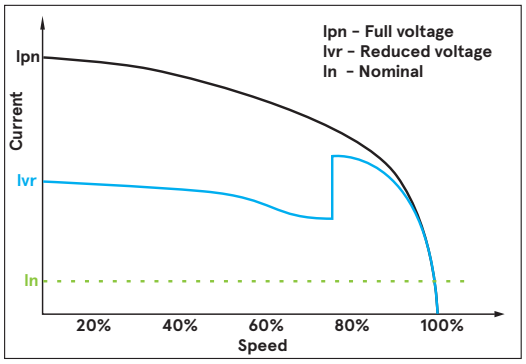
DESCRIPTION:

The Reduced Voltage Starters TX are manufactured using the most advanced technology. They feature a start/stop button station, an operation pilot light, and a digital voltmeter displaying the three line voltages along with their historical maximum/minimum values, including frequency.

The starter can also be ordered with a Manual-Off-Automatic selector for automatic operation.

OPERATION:

When electric motors are started at full voltage, they can draw currents up to 600% of their rated current. These high current values have the potential to create issues in the transformer, power supply line, or even result in the motor burning out.



Reduced voltage auto-transformer starters are designed to decrease the motor's voltage during startup, consequently reducing the current in proportion to the square of the voltage reduction. This prevents the startup current from reaching high values that could cause damage. These starters apply reduced voltage to the motor through an auto-transformer with taps to allow motor starting at 50, 65, and 80% of the line voltage.

By default, the auto-transformer is set to 65% of the voltage..

OPTIONAL EQUIPMENT

F3	Protection against low voltage, unbalance, and phase failure with Phasealert-3 model F3.
SEL	Manual-Off-Automatic operation selector; add an "A" after the model, for example, TX100-4-A.
AD	Three-phase RMS digital ammeter with max current recording.
VD	Three-phase RMS digital voltmeter with max/min voltage recording.
IS	Safety disconnect switch that disconnects power when opening the panel.

TO ORDER:

MODEL	VOLTAGE	HP	MAX CURRENT
TX10-2	220	10	30
TX15-2	220	15	43
TX20-2	220	20	56
TX25-2	220	25	69
TX30-2	220	30	80
TX40-2	220	40	105
TX50-2	220	50	138
TX60-2	220	60	150
TX75-2	220	75	183
TX100-2	220	100	245
TX125-2	220	125	300

MODEL	VOLTAGE	HP	MAX CURRENT
TX20-4	440	20	28
TX30-4	440	30	42
TX40-4	440	40	56
TX50-4	440	50	73
TX60-4	440	60	80
TX75-4	440	75	100
TX100-4	440	100	123
TX125-4	440	125	158
TX150-4	440	150	192
TX200-4	440	200	255
TX250-4	440	250	300

Soft Starter Panel

NEMA 4 | 1 YEAR WARRANTY

Model TAS

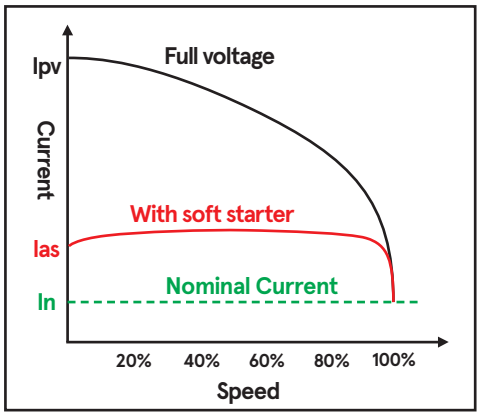
DESCRIPTION:

Soft starters are used to ramp up motors, gradually increasing their speed until reaching 100%. This avoids the full-voltage start-up current spikes, which can be as much as 600-800% of the nominal current.

This excessive start-up current causes problems affecting the lifespan of the motor, the contactor, the substation, and the electrical lines.

On the control panel, you can adjust the initial start voltage, the start ramp time, and the stop ramp time to achieve better performance in various applications.

START-UP CURRENT



ADVANTAGES OF THE SOFT STARTER IMPORTANT

The soft starter offers several advantages compared to the reduced voltage autotransformer starter:

- Voltage gradually increases in a ramp, minimizing the start-up current.
- It is adjustable depending on the application.
- Allows for extended starts.
- It has a stop ramp that reduces the water hammer effect in pump applications.
- Allows for twice the frequency in starts per hour.
- It has a more compact size and weight.
- It is less expensive.

SOFT STARTER COMPONENTS

- Thermal-magnetic switch for short-circuit protection.
- Short-circuit protection in control lines.
- Soft starter and bypass contactor.
- Operating indicator light.
- Start-stop button station or manual-off-automatic selector.
- Control transformer for 440 V voltages.
- Dust and water-proof panel NEMA 4, with corrosion-resistant paint.
- Protection against low voltage, unbalance, phase failure, and reverse sequence.*
- Digital voltmeter* and digital ammeter.*
- Dry-running protection for pumps, without the need for level probes.*

*** Optional**

TO ORDER:

VOLTAGE 220 V			VOLTAGE 440 V		
MODEL	HP	CURRENT RANGE	MODEL	HP	CURRENT RANGE
TAS10-2	10	24-30 A	TAS20-4	20	24-30 A
TAS15-2	15	37-45 A	TAS30-4	30	37-45 A
TAS20-2	20	48-60 A	TAS40-4	40	48-60 A
TAS25-2	25	63-73 A	TAS50-4	50	63-73 A
TAS30-2	30	80-85 A	TAS60-4	60	80-85 A
TAS40-2	40	90-100 A	TAS75-4	75	90-100 A
TAS50-2	50	100-140 A	TAS100-4	100	100-140 A
TAS60-2	60	140-170 A	TAS125-4	125	140-170 A
TAS75-2	75	170-210 A	TAS150-4	150	170-210 A
TAS100-2	100	210-250 A	TAS200-4	200	210-250 A
TAS125-2	125	250-300 A	TAS250-4	250	250-300 A

OPTIONAL EQUIPMENT

F3	Protection against low voltage, unbalance, and phase failure with Fasealert-3 model F3.
SEL	Manual-Off-Automatic operation selector.
IS	Safety disconnect switch that disconnects power when opening the panel.
VD	Three-phase RMS digital voltmeter with max/min voltage recording.
AD	Three-phase RMS digital ammeter with max current recording.

TECHNICAL SPECIFICATIONS:

Supply voltage	220/440 V ± 10%
Initial voltage	Adjustable from 40 to 80%
Start ramp	Adjustable from 0 to 15 sec.
Stop ramp	Adjustable from 0 to 20 sec
Start frequency	Maximum of 15/hour, heavy start: maximum of 10/hour.
Panel	NEMA 4 dust and water-proof.
Operating temperature	5 to 140° F

Variable Frequency Drive Panel

NEMA 4 | 1 YEAR WARRANTY

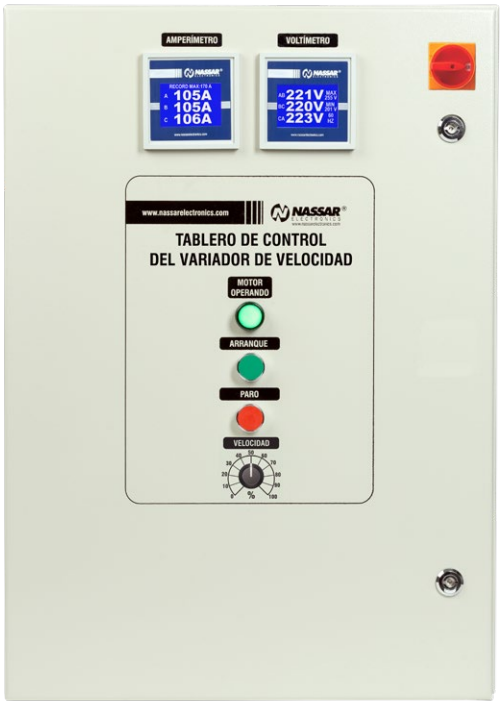
Model TCV

For use in:

- Pumps.
- Fans.
- Conveyor belts.
- Compressors.
- Mills.
- General motors from 1 to 100 HP.

Advantages:

- Ready-to-operate general design.
- Adjustable speed variation.
- Energy saving.
- Manual or automatic operation.



DESCRIPTION:

The TCV panels include a speed drive for three-phase motors with control systems for operation and protection against short circuits, overloads, and voltage failures.

It has an operation pilot light and a knob to manually adjust the motor speed from 0 to 100%.

It includes fans for forced cooling in the sizes that are required.

It can optionally be ordered with digital voltmeter and ammeter. Additionally, it can be requested with a programmable digital timer to schedule the start and stop at a specific time.

OPERATION:

With the manual start system, every time the start button is pressed, the motor starts with a 10-second ramp until it reaches the speed set on the knob.

When pressing the stop button, the motor stops with a 10-second ramp.

With the automatic start system, a Manual-Off-Automatic selector is used. Every time an external contact closes, the motor starts at the speed set on the front knob with a 10-second ramp. When the contact opens, the motor stops with a 10-second ramp.

This external contact can be a programmable digital timer, time relay, pressure/flow switch, or any other external device.

TO ORDER:

	Capacity	Voltage	Opcional Equipment
TCV –	□	– □	– □
	↑ HP	↑ 220 440	↑ PD VD

Example TCV – 05 – 220 – PD – SEL

5 HP panel at 220 V with protection against high voltage discharges and manual-off-automatic selector.

AMPERAGE TABLE:

HP	220 V AMP	440 V AMP
1	6	2.1
2	7.5	4.1
3	9.6	5.4
5	21	8.9
7.5	25	11.9
10	30	17.5
15	42	23.4
20	56	31
25	70	38
30	82	44
40	114	60
50	143	65
60	169	77
75	211	96
100	273	124

OPCIONAL EQUIPMENT

SEL	Automatic start with Manual-Off-Automatic selector.
VD	Three-phase voltmeter.
AD	Three-phase ammeter connected at the entrance.
PS	Programmable digital timer PS-100 for time-scheduled starts.
PD	PD-640 protector against voltage discharges.
IS	Safety disconnect switch that cuts off power when the panel is opened.

SERIES 10: Hydropneumatic Booster Control Panel

SERIES 10

UL MX -NOM | NEMA 4 | 3 YEAR WARRANTY

DESCRIPTION:

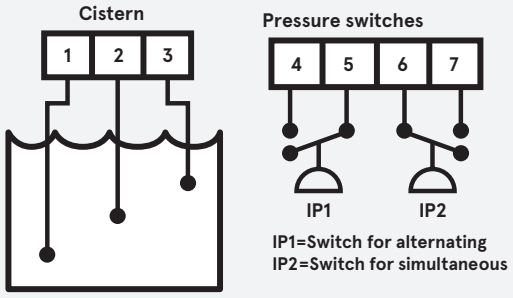
The SERIES 10 panels oversee the automatic operation of 1 to 4 pumps to maintain the desired pressure in the hydropneumatic tank within specified ranges set by the pressure switches.

For configurations with 2, 3, and 4 pumps, the panels alternate and run pumps simultaneously based on demand signals received from the pressure switches.

These panels include contactors and protection against short circuits, overload, low water levels in the cistern, alternating and simultaneous control modules, level probes, selectors, operation indicators for each pump, and dry-running indicators.

The SERIES 10 panels have an NEMA 4 metallic panel, dust and water-resistant, with corrosion-resistant paint.

EXAMPLE OF CONNECTION FOR 2 PUMPS



AMPERE TABLE:

HP	220 V AMP	440 V AMP
1	2.5-4	1.6-2.5
2	6-9	2.5-4
3	9-12	4-6
5	13-17	6-9
7.5	17-23	9-12
10	23-32	13-17
15	37-50	17-23
20	50-63	23-32
25	63-80*	32-40
30	80-90*	40-50
40	90-115*	50-63
50	115-150*	63-73*
60	150-185*	73-90*

* Note: For these sizes, it is recommended to use soft starters.

TO ORDER:

	Number of pumps	Capacity	Voltage	Optional equipment
10 -	□	□	□	□
	1, 2, 3, 4	HP	220 440	IP F3 AS PM

Example 10 - 2 - 05 - 220

2-pump panel, 5 hp at 220 V

OPTIONAL EQUIPMENT

IP	Pressure switches mounted on panel 7-87 Psi. (0.5-6 kg./cm2)
F3	Protection against low voltage and phase failure with Fasealert-3 model F3.
AS	Soft starters.
PM	Pump-Monitor, electronic overload relay with protection against dry-running without the need for level probes.
IS	Safety disconnect switch that cuts off the power when opening the panel.
VD	Three-phase RMS digital voltmeter with max/min voltage record.
AD	Three-phase RMS digital ammeter with max current record.

Series 10L: Digital Hydropneumatic Booster Control Panel

UL MX - NOM | NEMA 4 | 2 YEAR WARRANTY

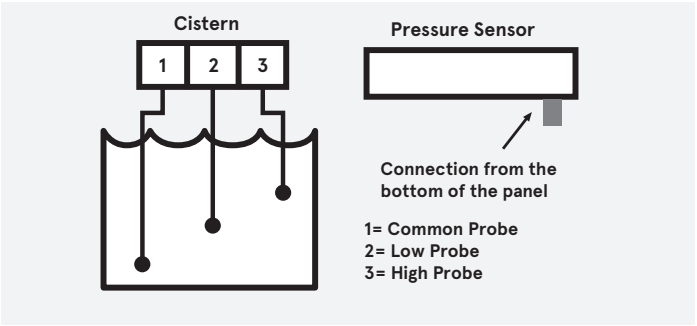
SERIES 10L
DESCRIPTION:

The SERIES 10L panels maintain water pressure within pre-established limits set by the user in the hydropneumatic tank. They oversee the automatic operation of 2 or 3 pumps, alternating and running pumps simultaneously based on start and stop signals received from a pressure sensor. They feature a digital gauge screen displaying system pressure in Psi/Kg.

Pressure adjustments for start, stop, and simultaneous operation are easily made on the same screen using an adjustment knob (maximum pressure 150 Psi, minimum start pressure 10 Psi).

These panels include contactors and protection against short circuits, overload, low water levels in the cistern, alternating and simultaneous control modules, level probes, indicators, and selectors. The panel has an NEMA 4 metal panel that is dust and water-resistant. By using a pressure sensor instead of multiple pressure switches, there is a cost saving (the pressure sensor is sold separately).

EXAMPLE OF CONNECTION:



TO ORDER:

Number of pumps	Capacity	Voltage	Optional equipment
10L - [ ]	- [ ]	- [ ]	- [ ]
2,3	HP	220 440	F3 AS PM

Example 10L - 2 - 05 - 220

AMPERAGE TABLE:

HP	220 V AMP	440 V AMP
1	2.5-4	1.6-2.5
2	6-9	2.5-4
3	9-12	4-6
5	13-17	6-9
7.5	17-23	9-12
10	23-32	13-17
15	37-50	17-23
20	50-63	23-32
25	63-80*	32-40
30	80-90*	40-50
40	90-115*	50-63
50	115-150*	63-73*
60	150-185*	73-90*

*Note: Soft starters are recommended for these sizes.

OPCIONAL EQUIPMENT

F3	Protection against low voltage and phase failure with Fasealert-3 model F3.
AS	Soft starters.
PM	Pump-Monitor, electronic overload relay with protection against dry-running without the need for level probes.
IS	Safety disconnect switch that cuts off the power when opening the panel.
MB*	Network connection for monitoring with Modbus RTU via RS-485 or Modbus TCP-IP via Ethernet.
VD	Digital three-phase RMS voltmeter with max/min voltage recording.
AD	Digital three-phase RMS ammeter with max current recording.

*Note: BACnet available using a converter.

Series 10V: Variable Speed Hydropneumatic Booster Control Panel

SERIES 10V

UL MX - NOM | NEMA 4 | 3 YEAR WARRANTY

ADVANTAGES:

- Save up to 50% on energy.
- Extend the lifespan of the pumps.
- Eliminate water hammer effect.
- Easy to adjust in the field and user-friendly design.
- The best-designed and highest quality panel on the market.

DESCRIPTION:

The SERIES 10V panels automatically control the operation of 1 to 4 pumps, alternating and synchronizing their performance to maintain constant pressure within the adjusted range, with a speed drive per pump.

The panel includes an LCD module that streamlines adjustments by sending signals to each controller, avoiding the need to individually modify the settings of the controllers.

The LCD screen displays information such as pressure, water level in the cistern, pump speed, faults, and configurations.

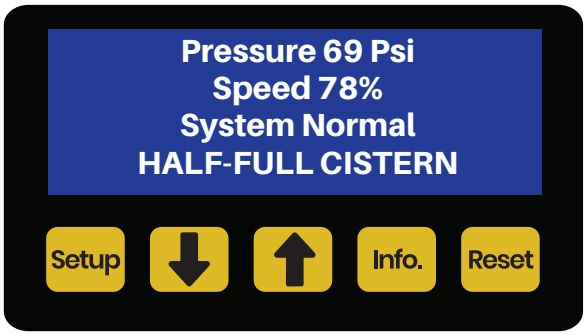
The panel features a manual-off-automatic selector, operation indicator lights for each pump, and an alarm light. It also offers the option for remote alarm monitoring via contact or optional Modbus communication. For BACnet communication, a converter is used.

The panel incorporates protections against: short circuits, low water levels in the cistern, overload, low voltage, and phase failure.

It utilizes a 200 Psi pressure sensor, although it can be ordered with higher pressures upon special request.

The panel is NEMA 4, dust and water-resistant, with corrosion-resistant paint.

If necessary, some larger models have forced ventilation.



AMPERE TABLE:

HP	220 V AMP	440 V AMP
1	6	2.1
2	7.5	4.1
3	9.6	5.4
5	21	8.9
7.5	25	11.9
10	30	17.5
15	42	23.4
20	56	31
25	70	38
30	82	44
40	114	60
50	143	65
60	169	77
75	211	96

TO ORDER:

	Number of pumps	Capacity	Voltage
10V -	☐ -	☐ -	☐
	↑ 1, 2, 3, 4	↑ HP	↑ 220 440

Example 10 V – 2 – 7.5 – 440

2-pump panel, 7.5 hp at 440 V

OPTIONAL EQUIPMENT

IS	Safety isolating switch that disconnects power when opening the panel.
MB*	Network connection for monitoring with Modbus RTU via RS-485 or Modbus TCP-IP via Ethernet.
PD	PD-640 protector against voltage surges.
VD	Three-phase digital RMS voltmeter with max/min voltage record.
AD	Three-phase digital RMS ammeter with max current record.

***Note: BACnet available using a converter.**

Series 20: Water Recirculation Pump Control Panel

NEMA 4 | 3 YEAR WARRANTY

SERIES 20 y 20T

DESCRIPTION:

The Series 20 and 20T panels oversee the automatic operation of pumps for water recirculation in cooling systems and other applications like pools and water treatment control. The pumps alternate automatically to ensure even wear and run simultaneously if the system requires more water. The panel features an adjustment to bypass a pump for maintenance without disrupting the system's automatic operation during the repair. It also includes operation indicators, a selector for manual, off, and automatic operation, and an LCD screen providing operation information, making control adjustments straightforward. Manufactured for 2 and 3 pumps, in the 3-pump models, the alternating setting can be configured to ensure at least 2 pumps are always operational simultaneously. This function is useful for increasing recirculation flow when needed.

The Series 20 and 20T panels can be configured for various automatic operation modes:

OPERATION BY PERIOD (SERIES 20)

The pumps alternate automatically after a time period (configurable from 1 minute up to 24 hours). Simultaneous operation is triggered by the contact of an external device that sends the start signal. This external contact can come from a programmable digital timer or another device.

OPERATION BY SCHEDULE (SERIES 20):

The alternating start of the pumps is scheduled to occur on a specific day and time, presenting energy savings compared to interval-based startup. It requires a programmable digital timer which is not included and must be ordered separately. The panel starts one pump alternately each time the programmer's contact closes; when the contact opens, the pumps shut down. Simultaneous operation is achieved through the contact of an external device that signals the start.

OPERATION BY TEMPERATURE (SERIES 20T):

The panel includes a temperature sensor to alternate and operate the pumps simultaneously automatically. The operation starts with an external contact, and pumps alternate on each start. The water temperature at which the pumps start simultaneously can be programmed.

TO ORDER:

	Number of pumps		Capacity		Voltage		Optional equipment
☐	–	☐	–	☐	–	☐	– ☐
↑		↑		↑		↑	
20, 20T		2, 3		HP		220 440	F3 AS

Example 20 – 2 – 7.5 – 440

SERIES 20 Control Panel for 2 pumps of 7.5 hp at 440 V.

AMPERAGE TABLE:

HP	220 V AMP	440 V AMP
1	2.5-4	1.6-2.5
2	6-9	2.5-4
3	9-12	4-6
5	13-17	6-9
7.5	17-23	9-12
10	23-32	13-17
15	37-50	17-23
20	50-63	23-32
25	63-80*	32-40
30	80-90*	40-50
40	90-115*	50-63
50	115-150*	63-73*
60	150-185*	73-90*

Available sizes up to 250 HP.
***Note: Soft starters are recommended for these sizes.**

OPCIONAL EQUIPMENT

PSA	Programmable digital timer PS-100 for alternating operation by schedule.
PSS	Programmable digital timer PS-100 for simultaneous operation by schedule.
F3	Protection against low voltage, unbalance, and phase failure with Fasealert-3 model F3.
AS	Soft starters.
VD	Digital three-phase RMS voltmeter with max/min voltage logging.
AD	Digital three-phase RMS ammeter with max current logging
MB	Network connection for monitoring with Modbus RTU via RS-485 or Modbus TCP-IP via Ethernet.
IS	Safety disconnect switch that cuts off power when opening the panel.

Series 30: Water Level Control Panel for Cistern-Tank Systems

SERIE 30

UL MX -NOM | NEMA 4 | 3 YEAR WARRANTY

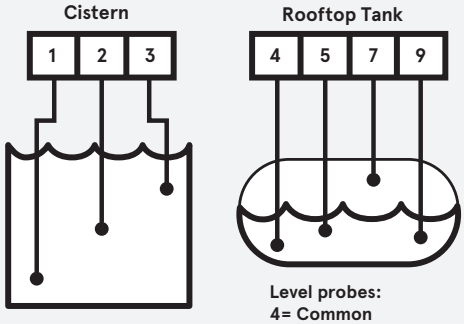
DESCRIPTION:

The SERIES 30 panels oversee the automatic operation of 1 to 4 pumps, alternating and running them simultaneously to maintain the water level in the tank within the desired range set by the level probes.

These panels include contactors and protection against short circuits, overload, low water levels in the cistern, alternating and simultaneous control modules, level probes, selectors, operation indicators for each pump, and dry-running indicators.

The panel features a metallic NEMA 4 enclosure that is dust and water-resistant, coated with corrosion-resistant paint.

EXAMPLE OF CONNECTION FOR 2 PUMPS



1= Common Probe
2= Low Probe
3= High Probe

Level probes:
4= Common
5= Alternation
7= Stop
9= Simultaneous

AMPERE TABLE:

HP	220 V AMP	440 V AMP
1	2.5-4	1.6-2.5
2	6-9	2.5-4
3	9-12	4-6
5	13-17	6-9
7.5	17-23	9-12
10	23-32	13-17
15	37-50	17-23
20	50-63	23-32
25*	63-80*	32-40
30*	80-90*	40-50
40*	90-115*	50-63
50*	115-150*	63-73*
60*	150-185*	73-90*

*Note: For these sizes, it is recommended to use soft starters.

TO ORDER:

	Number of pumps	Capacity	Voltage	Optional equipment
30 -	□	□	□	□
	1, 2,3,4	HP	220 440	F3 AS

Example 30 - 2 - 05 - 220

2-pump panel, 5 hp at 220 V

OPTIONAL EQUIPMENT

F3	Protection against low voltage and phase failure with Fasealert-3 model F3.
AS	Soft starters.
IS	Safety disconnect switch that cuts off the power supply when opening the panel.
VD	Three-phase RMS digital voltmeter with max/min voltage recording.
AD	Three-phase RMS digital ammeter with max current recording.

Series 40: Sump and Sewage Pump Control Panel

SERIES 40

UL MX -NOM | NEMA 4 | 3 YEAR WARRANTY

DESCRIPTION:

The SERIES 40 panels manage the automatic operation of 1 to 4 pumps, alternating and running them simultaneously to maintain an empty tank within previously established levels using level detectors (float switches).

These panels feature contactors and protection against short circuits, overload, alternating and simultaneous control modules, operation indicators for each pump, and selectors.

The panel is housed in a metallic NEMA 4 panel, dust and water-resistant, with corrosion-resistant paint.

TO ORDER:

	Number of pumps		Capacity		Voltage		Optional equipment
40	–	□	–	□	–	□	–	□
		↑		↑		↑	↑
		1, 2, 3, 4		HP		220 440	F3 AS DFS DN1 DN2 AL

Example 40 – 2 – 05 – 220

2-pump panel of 5 hp at 220 V

AMPERAGE TABLE:

HP	220 V AMP	440 V AMP
1	2.5-4	1.6-2.5
2	6-9	2.5-4
3	9-12	4-6
5	13-17	6-9
7.5	17-23	9-12
10	23-32	13-17
15	37-50	17-23
20	50-63	23-32
25*	63-80*	32-40
30*	80-90*	40-50
40*	90-115*	50-63
50*	115-150*	63-73*
60*	150-185*	73-90*

*Note: Soft starters are recommended for these sizes.

Available sizes up to 250 HP.

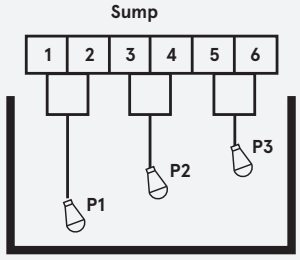
CONNECTION EXAMPLE FOR 2 PUMPS:

LEVEL FLOAT SWITCHES

P1: Stop float.

P2: Start float.

P3: Simultaneous operation float.



OPCIONAL EQUIPMENT

F3	Protection against low voltage, phase failure with Fasealert-3 model F3.
AS	Soft starters.
DFS	Seal leak and high-temperature detector model DFS-12. (One per pump)
DN2	Level detector (float switch) with NO y NC mechanical contacts, 23 ft. (7m) in length.
DN1	Level detector (float switch) with mercury NO contact, 23 ft. (7m) in length.
AL	Visual and audible high-level alarm in the sump, requires float switch. Includes an alarm contact.
MB*	Network connection for monitoring with Modbus RTU via RS-485 or Modbus TCP-IP via Ethernet.
IS	Safety disconnect switch that cuts off the power supply when opening the panel.
VD	Three-phase RMS digital voltmeter with max/min voltage recording.
AD	Three-phase RMS digital ammeter with max current recording.

*Note: BACnet available using a converter.

AP: Pump Starter with Pump-Monitor Protection

NEMA 4 | 3 YEAR WARRANTY

SERIES AP

- **Protects pumps against overload, phase failure, and dry-running, without the need for level probes.**
- **With button station: Start, stop or Selector: manual, off, automatic.**

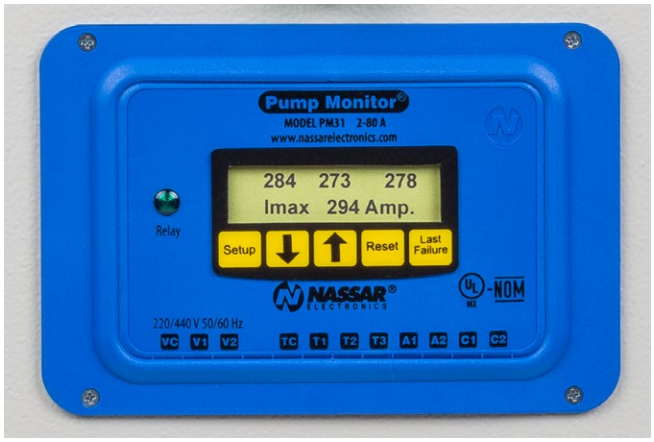
DESCRIPTION:

The AP Series starters are designed to initiate and protect pumps against overload, phase failure, and dry-running (low load) without the need for level probes. This panel is specifically tailored for locations where using level probes, such as in wells, is challenging and requires a higher degree of protection against overload and phase failure.

The Pump Monitor is more effective and precise in protecting against overload compared to standard overload relays. It incorporates a rapid phase failure protection mechanism with a maximum response time of 5 seconds.

THE AP STARTERS INCLUDE:

Contactors, short-circuit protection, overload protection, low load, and phase failure protection with Pump-monitor; start-stop button station on the standard starter. Manual, off, automatic selector upon request, operating pilot light, and transformer, all mounted in a metallic NEMA 4 panel that's dust and water-resistant, painted with corrosion-resistant paint.



TO ORDER:

	Capacity		Voltage		Opcional
AP	- ☐	-	☐	-	☐
	↑		↑		↑
	HP		220 440		AS F3 DFS MFA PMF

OPTIONAL EQUIPMENT

F3	Protection against low voltage and phase failure with Fasealert-3 model F3.
AS	Soft starters.
DFS	Seal leak and high temperature detector, model DFS-12.
SEL	Manual-Off-Automatic operation selector.
IS	Safety disconnector switch that disconnects the power when opening the panel.
PMF	Front mounting of the Pump-Monitor on the panel door. (Not suitable for outdoor use)
VD	Three-phase digital RMS voltmeter with max/min voltage recording.

AMPERE TABLE:

HP	220 V AMP. MAX	440 V AMP. MAX
5	18	9
7.5	25	12
10	32	18
15	50	25
20	65	32
25*	75*	40
30	80*	50
40	112*	65*
50		75*

*Note: For these sizes, it is recommended to use soft starters.

Model T1B-B / T1B-D: Single Battery Fire Pump Controller for Internal Combustion Engines

UL MX -NOM | NEMA 4 | 3 YEAR WARRANTY

MODEL T1B

DESCRIPTION:

The T1B fire control panels cover most of the requirements outlined in N.F.P.A.'s handbook #20. These panels oversee the automatic operation of a pump powered by a gasoline or diesel engine. The panel automatically starts the pump motor when a pressure drop occurs in the fire network. This drop is detected through the pressure switch, signaling the control to initiate 5 start attempts of 10 seconds, alternating with 5 rest periods of 10 seconds.

When the network pressure rises, the pressure switch sends the stop signal to the control, which stops the engine after the set delay time has elapsed.

T1B PANELS INCLUDE:

- Control module with 4-line backlit LCD screen.
- Fault memory.
- Indicator lights for: Automatic board operation, operation call, and fault.
- Control of 5 start attempts and 10-second rests.
- Digital tachometer with overspeed alarm.
- Automatic battery charger controlled by microprocessor, with adjustable cutoff and charge settings that double the battery life, factory calibrated.
- Hour meter indicating the pump's operating time.
- Manual-Off-Automatic operation selector.
- Buttons for: manual start, manual stop, and test.
- Manual/automatic stop selector.
- Digital voltmeter and ammeter for the battery.
- Protection against:
  - Low oil pressure.
  - High water temperature.
  - Start failure.
  - Overspeed.
- Optional automatic test with programmable digital timer and outlet for automatic relief valve opening during testing. (Optional)
- Adjustable 0-6 minute stop delay.
- Adjustable start delay.
- Optional remote alarm contact.
- Audible alarm.
- The LCD screen displays:
  - Panel operation.
  - Start delay settings, stop delay, manual/automatic stop, tachometer calibration, and overspeed limit.
  - All faults, including supply voltage failure in the charger and low battery.
- Red panel with safety key, NEMA 4 dust and waterproof, 15.75 x 11.81 x 7.87 in.
- Packaged weight: 28 lb.

TO ORDER:

MODEL	FOR ENGINES:
T1B-D	Diesel or Gasoline Engines
T1B-B*	Briggs & Stratton Vanguard or Kohler Gasoline

*** Note: For engines that, upon starting, require disconnecting a terminal to the ground and, to turn them off, require it to be reconnected to the ground.**

OPCIONAL EQUIPMENT

IP	Pressure switch 15-147 Psi. (1-10 kg.)
PS	PS-100 programmable digital timer with outlet for relief valve.
AL	Remote alarm contact.

Model T2B-12 / T2B-24: Dual Battery Fire Pump Controller for Diesel Engines

UL MX -NOM | NEMA 4 | 3 YEAR WARRANTY

MODEL T2B

DESCRIPTION:

The T2B fire control panels cover most of the requirements outlined in N.F.P.A.'s handbook #20. The T2B is used to control the automatic start and stop of a diesel internal combustion engine with 2 batteries.

The panel automatically starts the pump's engine when a pressure drop occurs in the fire network; this drop is detected by the pressure switch, which sends a start signal to the control. The control then initiates 6 start attempts of 10 seconds each, alternated with 5 rest periods of 10 seconds. When the pressure in the network rises, the pressure switch sends a stop signal to the control, which stops the engine after the time set in the stop delay has elapsed.

T2B PANELS INCLUDE:

- Control module with illuminated LCD screen.
- Fault memory.
- Indicators for Automatic Panel mode, operation call, and fault.
- Control of 6 start attempts and 10-second breaks.
- Battery alternator.
- Detector to cancel alternating when one battery is low.
- Protection against reversed polarity.
- Audible alarm when a battery is low (one beep every minute).
- Digital tachometer with overspeed adjustment.
  - Hour meter indicating pump operating time.
- Two automatic battery chargers controlled by a microprocessor, with cutting and charging adjustments that double the battery life, factory calibrated.
- Charging cut at startup.
- Control overload protector.
- 22 mm selector for Manual-Off-Automatic operation.
- 22 mm buttons for manual start of battery #1 and #2.
- Test button.
- Button to clear fault memory.
- Manual-automatic stop selector.
- Manual stop button.
- Digital voltmeters and ammeters for each battery.
- Protection for:
  - Low oil pressure.
  - High water temperature.
  - Start failure.
  - Overspeed.
- Adjustable start and stop delay 0-6 min.
- Remote alarm contact or control contact for the return solenoid valve.
- Monitoring via Modbus RTU or Modbus TCP-IP. (Optional)
- Audible alarm.
- Indicators for:
  - Automatic panel.
  - Operation call.
  - Engine running.
  - Stop delay.
  - Supply voltage failure
  - Battery voltages.
  - Low battery alarm.
  - Battery charging amperes.
  - Start failure.
  - Low oil pressure failure.
  - High water temperature failure.
  - Overspeed failure.
- Red panel, with a security key, NEMA 4 measuring 19.68 X 15.75X 7.87 in, dust and water-resistant.
- Weight with cardboard packaging: T2B-12 (44lb), T2B-24 (60lb).

OPTIONAL EQUIPMENT

PS	Programmable digital timer PS-100 with an outlet for a relief valve.
MB	Network connection for monitoring with Modbus RTU via RS-485 or Modbus TCP-IP via Ethernet.*
IP	Pressure switch 15-147 Psi. (1-10 kg.)

***Note: BACnet available using a converter.**

TO ORDER:

MODEL	VOLTAGE
T2B-12	12 VDC
T2B-24	24 VDC

Series 60-PV: Full Voltage Electric Motor Fire Pump Controller

SERIES 60-PV

UL MX -NOM | NEMA 4 | 3 YEAR WARRANTY

DESCRIPTION:

The SERIES 60 Fire Control Panels oversee the automatic operation of electric motor-driven fire pumps. They detect the water level in the cistern, feature operation indicators and indicators for dry-running, an adjustable stop delay, and can include the option for manual shutdown. The start signal is obtained from a pressure switch. Upon pressure restoration, the control system starts the shutdown delay, adjustable from 0 to 6 minutes. Once this time elapses, the pump turns off. If the manual stop option is selected, the pump remains running until the stop button is pressed.

The indication for "Dry-running" is solely provided by the indicator light; by default, the equipment only indicates this fault without stopping the pump unless it's in the shutdown delay. SERIES 60 panels can be requested to control the JOCKEY pump within the same panel, but this is not recommended due to safety standards.

THE 60-PV PANELS INCLUDE:

- Full tension magnetic contactor.
- Thermomagnetic switch of 25 KA @ 220 V and 10 KA @ 440 V (Magnetic switch available).
- Dry-running detector and indicator.
- Control module.
- Set of 3 level probes for the cistern.
- Adjustable stop delay of 0-6 minutes.
- 22mm selector for Manual-Off-Automatic operation of the pump.
- 22mm pilot lights that indicate: Pump operating and dry-running.
- 440/220 V control transformer for 440 V panels.
- Metallic panel with security key, NEMA 4 dust and water-resistant, red color.
- Control connection board.

OPCIONAL EQUIPMENT

IP	Pressure switch 15-147 Psi. (1-10 kg.)
IS	Safety disconnect switch that cuts off the AC power supply when opening the panel.
IM	Magnetic breaker. (Available from 12 Amp.)
VD	Three-phase RMS digital voltmeter with max/min voltage record and frequency meter.
AD	Three-phase RMS digital ammeter with max current record.

TO ORDER:

	Capacity	Voltage	Optional equipment
60PV -	☐ -	☐ -	☐
	↑ HP	↑ 220 440	↑ IP VD

Example 60-PV – 05 – 220 – IP

5 hp board at 220 V with pressure switch.

AMPERAGE TABLE:

HP	220 V AMP	440 V AMP
1	5.5	3.3
2	7.5	4.8
3	12	6.5
5	18	9
7.5	25	12
10	32	18
15	50	25
20	65*	30
25	72*	38
30	80*	45
40		57*
50		80*

*Note: For capacities marked with * or greater than this table, it is recommended to use a soft voltage starter SERIES 60-AS.

Series 60-JK: Jockey Pump Controller

SERIES 60-JK

DESCRIPTION:

The SERIES 60-JK Fire Control Panels oversee the automatic operation of Jockey pumps. The start signal is obtained from a pressure switch placed in the fire network.

When the pressure in the network drops, the panel activates the pump and shuts it off once the pressure in the fire network is restored.

Additionally, the 60-JK panel can be ordered with an adjustable minimum operation timer from 0 to 3 minutes. Once the panel starts the pump, this timer ensures that it operates for at least a set period.

This prevents the pump from constantly starting and stopping in the event of pressure fluctuations in the network.

THE JOCKEY PUMP PANELS SERIE 60-JK INCLUDE:

- Full voltage magnetic contactor.
- Motor protector.
- 22 mm selector for Manual-Off-Auto pump operation.
- 22 mm pilot light indicating pump operation.
- Minimum operation timer from 0 to 3 Min. (optional).
- Control transformer 220/440 V for 440 V panels.
- Metallic panel, NEMA 4, red color, dust and water-resistant, measuring 11.81 x 9.8 x 5.9 in.
- Control connection board.

AMPERE TABLE:

HP	VOLTAGE	AMP
1	220	2.5-4
2	220	6-9
3	220	9-12
5	220	13-17
1	440	1.6-2.5
2	440	2.5-4
3	440	4-6
5	440	6-9

UL MX -NOM | NEMA 4 | 1 YEAR WARRANTY

TO ORDER:

	Capacity		Voltage		Optional equipment
60JK	-	☐	-	☐	- ☐
		↑ HP		↑ 220 440	↑ IP VD

Example 60-JK – 05 – 220 – IP

5 hp board at 220 V with pressure switch.

OPTIONAL EQUIPMENT

RT	Minimum operation timer of 0-3 min.
IP	Pressure switch 15-147 Psi. (1-10 kg.)
AL	Remote alarm contact for voltage failure.
IS	Safety disconnect switch that cuts off AC power supply when the panel is opened.
VD	RMS three-phase digital voltmeter with max/min voltage record.
AD	RMS three-phase digital ammeter with maximum current record.

Series 60-AS: Soft Start Electric Motor Fire Pump Controller

UL MX - NOM

3 YEAR WARRANTY

NEMA 4

SERIES 60-AS

DESCRIPTION:

The SERIES 60-AS Fire Control Panels with soft starters oversee the automatic operation of a fire pump operated by an electric motor.

The 60-AS panel initiates the pump's startup by gradually increasing the voltage in a ramp format, allowing for a smooth start and significantly reducing the starting current peaks.

When the pressure drops in the network, the pressure switch sends the start signal. When the pressure reaches the stop level, the control system initiates an adjustable stop delay from 0 to 6 minutes, after which the pump shuts off.

Moreover, the soft starter also employs a ramping technique to shut down the motor, reducing the water hammer effect.

The panels feature a selector to choose between automatic shutdown with a delay or manual shutdown by pressing the stop button.

Standards prohibit the pump from shutting down due to "Dry Running" failure; the fault is indicated solely by the indicator light. However, during the stop delay, the pump does shut off.

THE 60AS PANELS INCLUDE:

- Soft starter and Bypass contact.
- Magnetic switch.
- Selector for manual or automatic stop.
- Manual stop button.
- Dry-running detector and indicator.
- Control module.
- Adjustable stop delay of 0-6 minutes.
- Manual-Off-Auto operation selector for the pump.
- Pilot lights for: Pump operating, Selector in automatic, and dry-running.
- 440/220 V control transformer for 440 V panels.
- Metallic NEMA 4 panel, dust and water-resistant, in red.
- Control connection board.
- Remote monitoring with Modbus RTU or Modbus TCP-IP. (Optional)
- SPDT contacts for remote signaling of: Pump operating and dry-running. (Optional)

OPCIONAL EQUIPMENT

IP	Pressure switch 15-147 Psi. (1-10 kg.)
CR	Remote signaling contacts.
AL	Remote alarm contact for voltage failures.
MB	Network connection for monitoring with Modbus RTU via RS-485 or Modbus TCP-IP via Ethernet.
IS	Safety isolator switch that disconnects AC power when the panel is opened.
VD	Three-phase digital RMS voltmeter with max/min voltage recording.
AD	Three-phase digital RMS ammeter with max current recording.

TO ORDER:

	Capacity	Voltage	Optional equipment
60AS -	☐	☐	☐
	HP	220 440	IP CR

Example 60AS - 50 - 220 - IP

50 H.P board at 220 V with pressure switch.

AMPERAGE TABLE:

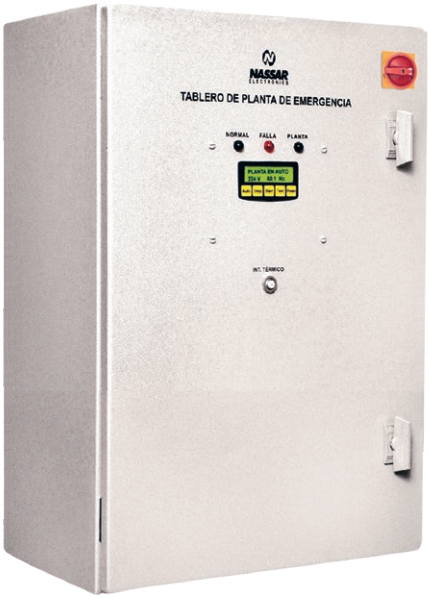
HP	220 V AMP	440 V AMP
10	30	
15	45	
20	60	30
25	73	
30	85	45
40	100	60
50	140	73
60	170	85
75	210	100
100	250	140
150		210
200		250
250		300

PE: Emergency Power System Control Panel with Transfer Switch

Model PE100 from 5 to 170 Kw.

3 YEAR WARRANTY

NEMA 4



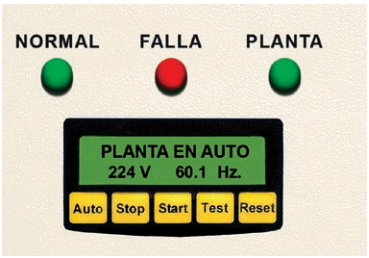
DESCRIPTION:

The PE-100 panels are of excellent quality, manufactured with the most advanced electronic technology to control the automatic operation of an emergency power generator powered by a gasoline or diesel engine. The panel automatically starts the generator when there is a failure in the normal voltage supply, disconnects the normal supply and connects the emergency generator.

When the supply voltage is restored, it disconnects the generator and connects the normal supply, then turns off the generator.

FEATURES:

- Control module with illuminated LCD screen that indicates:
  - Generator operation.
  - Generator voltage.
  - Battery voltage.
  - Generator frequency.
  - Startup delay.
  - Shutdown delay.
  - Failures.
- Control of 6 startup attempts with 10-second breaks.
- Monitors the normal supply for: high and low voltage, phase failure, and phase sequence.
- Indicator lights for: normal supply voltage, emergency generator voltage, and failures.
- Thermal protection switch in the battery, in the normal supply, and in the generator supply.
- Factory-calibrated 12 VDC automatic battery charger, 3 Amp, controlled by a microprocessor that doubles the battery life.
- Programmable digital timer for automatic testing (optional).
- Detection of all voltage failures with Fasealert-3 in the normal network.



FOR SINGLE-PHASE GENERATORS:

MODEL	VOLTAGE	AMP*	KW**	KVA	PANEL SIZE:
PE100-50-1M	120	50	5	6	4
PE100-80-1M	120	80	8.2	9.6	4
PE100-100-1M	120	100	10.2	12	5
PE100-130-1M	120	130	13.3	15.6	5
PE100-50-2M	220	50	9.4	11	4
PE100-80-2M	220	80	15	17.6	4
PE100-100-2M	220	100	18.7	22	5

* All contactor amperage capacities are in AC-1 for temp. < 104 ° F
** The KW calculation is considering a PF of 0.85.

OPTIONAL EQUIPMENT

PS	Programmable digital timer PS-100 for automatic testing.
IS	Safety disconnect switch that cuts off the alternating current supply when opening the panel.

FOR THREE-PHASE GENERATORS:

MODEL	VOLTAGE	AMP*	KW**	KVA	PANEL SIZE:
PE100-50-2	220	50	16.2	19	4
PE100-80-2	220	80	25.9	30.4	4
PE100-100-2	220	100	32.4	38.1	5
PE100-130-2	220	130	42.1	49.5	5
PE100-160-2	220	160	51.8	60.9	6
PE100-210-2	220	210	67.9	79.9	6
PE100-230-2	220	230	74.4	87.5	6
PE100-270-2	220	270	87.3	102.8	7
PE100-350-2	220	350	113.2	133.2	8
PE100-100-4	440	100	64.7	76.1	5
PE100-130-4	440	130	84.1	99	5
PE100-160-4	440	160	103.5	121.8	6
PE100-210-4	440	210	135.9	159.9	6
PE100-230-4	440	230	148.8	175.1	6

* All contactor amperage capacities are in AC-1 for temp. < 104 ° F
** The KW calculation is considering a PF of 0.85.

PANEL DIMENSIONS:

SIZE	HEIGHT	WIDTH	DEPTH
4	60	40	25
5	70	50	25
6	80	60	30
7	100	80	30
8	120	100	30

PANEL SIZES FOR FULL VOLTAGE PANELS

HP	VOLTAGE	1 PUMP	2 PUMPS	3 PUMPS	4 PUMPS
1 to 5	220V	S2	S2	S3	S4
7.5	220V	S2	S2	S3	S4
10	220V	S2	S3	S4	S4
15	220V	S3	S5	S5	S6
20	220V	S3	S5	S5	S6
25	220V	S3	S5	S5	S6
30	220V	S3	S5	S5	S6
1 to 5	440V	S2	S2	S3	S4
7.5	440V	S2	S2	S3	S4
10	440V	S2	S2	S3	S4
15	440V	S2	S2	S3	S4
20	440V	S3	S3	S4	S4
25	440V	S3	S4	S4	S5
30	440V	S3	S4	S5	S6
40	440V	S3	S4	S5	S6
50	440V	S3	S4	S5	S6

PANEL DIMENSIONS

PANEL	HEIGHT (IN)	WIDTH (IN)	DEPTH (IN)
S2	15.75	11.81	7.87
S3	19.69	15.75	7.87
S4	23.62	15.75	9.84
S5	27.56	19.69	9.84
S6	31.50	23.62	9.84
S7	39.37	31.50	11.81
S8	47.24	31.50	11.81
S9	55.12	47.24	13.78
S10	62.99	47.24	15.75

FIGURE 1

Inches

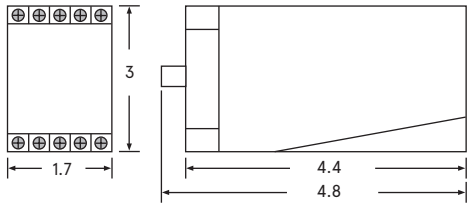


FIGURE 2

Inches

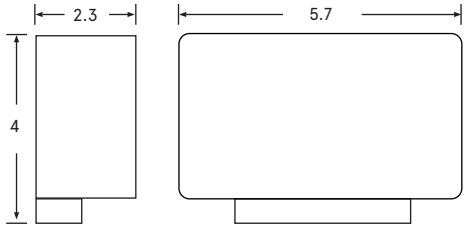


FIGURE 3

Inches

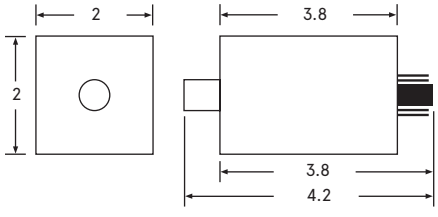
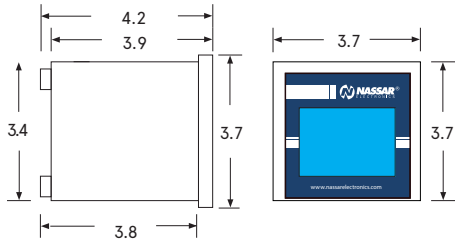


FIGURE 4

Inches



All specifications are subject to change without prior notice.

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