SIEMENS

Product Guide

NEMA pump controls

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Class 87 full voltage pump controller with fusible disconnect switch and standard features

Class 87 NEMA full starter pump control panels

Product description and application

The Siemens full voltage starter pump controllers are specifically designed for the agricultural, petrochemical and other industries requiring pump control. They are built to withstand the harsh elements of the outdoors and are well suited for the most demanding environments.

Typical applications include:

- Crop Irrigation
- Oil Fields
- Waste Water Treatment
- Sprinklers

Features and benefits

- Heavy-duty NEMA starter sizes 1- 6 including Siemens exclusive half-size starters to provide reliable motor control and protection expected in the most demanding applications
- The ESP200 solid-state overload relay has a protective coating on the circuit board which gives it superior protection against high humidity, condensation and corrosive environments
- Heavy-duty disconnect switch with visible blades for safety and double break switch action to reduce arcing and increase lifetime (also available with circuit breaker)
- Line side shield on disconnect switch to help guard personnel from contact with live parts
- Type 3/3R enclosure fabricated with galvannealed steel versus conventional cold rolled steel for superior corrosion resistance
- Rugged 30 mm H-O-A switch and Start push button, which are standard features, meet Type 3, 4, 12, and 13 specifications and are oil and dust tight for durability
- Pre-punched opening with cover plate for convenient field installation of a conduit hub should top entry be required
- Full gasketed door to ensure a dust tight and water tight seal
- Mounting flanges at top and bottom of enclosure for easy mounting on poles or flat surfaces using keyhole slots
- Auxiliary control panel for field mounting additional controls or for use as a wire way for large power conductors
- Heavy-duty quarter-turns for fast entry and proper sealing of enclosure
- Door is removable for ease of installation and maintenance
- Factory and field modifications for custom applications
- UL rated as Service Entrance Equipment permitting equipment to be pole mounted and installed directly off of utility power lines
- UL listed

Class 87 pump panel with Vacuum Contactor

Class 87 NEMA vacuum starter pump control panels

Product description and application

The Siemens vacuum starter pump controllers are designed for the harshest environments. Typical environments include chemical, petrochemical, waste water treatment and mining. Contaminations present in these severe environments are detrimental to conventional air-break contacts decreasing their life expectancy and reliability. The Siemens vacuum starter pump controllers are well suited for these environments because the contacts are contained in hermetically sealed contact tubes. This prevents contaminates in the atmosphere from affecting the operation of the contacts. Additionally, neither arcs nor arcing gases are produced which dramatically increases the electrical endurance of the contacts.

Features and benefits

- Heavy-duty NEMA vacuum starter sizes 4 - 6 to provide reliable motor control and protection expected in the most demanding applications
- Hermetically sealed contacts preventing environment from adversely affecting their operation
- No arcs nor arcing gases are produced minimizing erosion and thus increasing the electrical endurance of the contacts
- Available with a fusible disconnect switch or circuit breaker
- Type 3/3R enclosure which is fully gasketed to ensure a dust tight and water tight seal
- Rugged 30 mm H-O-A switch and Start push button, which are standard features, meet Type 3, 4, 12, and 13 specifications and are oil and dust tight for durability
- Door is removable for ease of installation and maintenance
- Factory and field modifications for custom applications
- UL rated as Service Entrance Equipment permitting equipment to be pole mounted and installed directly off of utility power lines
- UL listed

Class 87 full voltage pump controller with fusible disconnect switch and standard features

Siemens exclusive – Class 87 NEMA full voltage starter pump control panels with 958L overload relay

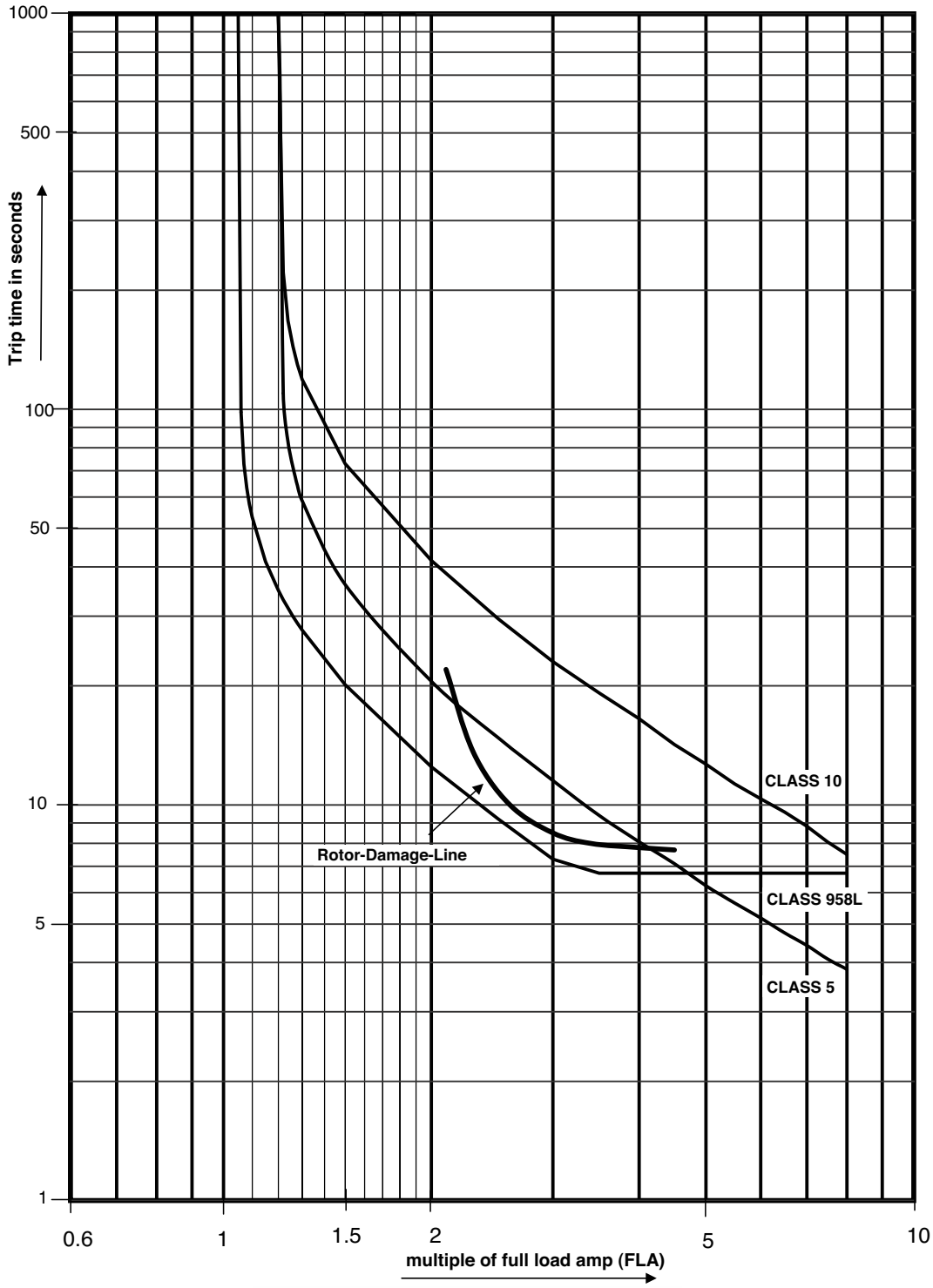
Product description and application

The Class 87 with 958L overload relay is designed specifically for the oil market and the cyclical loads experienced with these types of pumping applications. Unmatched in the industry, this product provides superior protection on all standard motors, oil well pump motors, multi-torque connections, and ultra-high slip motors. Rotors can be damaged in 8 to 15 seconds during motor stall conditions if electrical power is not removed. The 958L overload relay removes power in time to prevent damage during motor stall. Therefore, die cast or fabricated rotors will be protected from damage saving you both time and money. Refer to the graph on the following page to see how the 958L responds faster than the standard overload relays.

Features and benefits

- Heavy-duty NEMA starter sizes 2 – 4 including Siemens exclusive half-size starters to provide reliable motor control and protection expected in the most demanding applications
- The ESP200 958L solid-state overload relay has a protective coating on the circuit board which gives it superior protection against high humidity, condensation and corrosive environments
- Heavy-duty disconnect switch with visible blades for safety and double break switch action to reduce arcing and increase lifetime (also available with circuit breaker)
- Line side shield on disconnect switch to help guard personnel from contact with live parts
- Type 3/3R enclosure fabricated with galvannealed steel versus conventional cold rolled steel for superior corrosion resistance
- Rugged 30 mm H-O-A switch and Start push button, which are standard features, meet Type 3, 4, 12, and 13 specifications and are oil and dust tight for durability
- Pre-punched opening with cover plate for convenient field installation of a conduit hub should top entry be required
- Full gasketed door to ensure a dust tight and water tight seal
- Mounting flanges at top and bottom of enclosure for easy mounting on poles or flat surfaces using keyhole slots
- Auxiliary control panel for field mounting additional controls or for use as a wire way for large power conductors
- Heavy-duty quarter-turns for fast entry and proper sealing of enclosure
- Door is removable for ease of installation and maintenance
- Factory and field modifications for custom applications
- UL rated as Service Entrance Equipment permitting equipment to be pole mounted and installed directly off of utility power lines
- UL listed

Time - Current - Characteristics
CLASS 958L, Class 5 and Class 10



958L Overload Relay

Class 84 duplex motor in type 1 enclosure

Class 83 and Class 84 NEMA duplex motor controllers

Product description and application

The Siemens duplex motor controllers are specifically designed for industrial and commercial applications that require duplex controls such as duel pumps or blowers. They are built to withstand demanding environments found both indoors and outdoors. Duplex motor controllers consists of two motor starters in a common enclosure. Class 83 is a non-combination duplex motor controller. Class 84 is a combination duplex motor controller with two separate disconnects or circuit breakers.

The Siemens duplex motor controllers are designed to perform one or both of two distinct functions: duplexing and alternation. The duplexing function provides capacity for system peaking or above normal demand without having both motors running at all times. It also provides standby capacity for use when one of the motors is disabled. The alternation function reverses the lead and lag mode for the two motors in a duplex system. Upon alternation the first motor becomes the lag motor and the second motor assumes the lead function. The alternation is usually programmed to occur at any time both motors come to rest. The alternation function equalizes wear on the two machines and extends the life of seals and bearings.

Features and benefits

- Heavy-duty NEMA starter sizes 0 – 4 including Siemens exclusive half-size starters to provide reliable motor control and protection expected in the most demanding applications. Combination controllers are available with a disconnect switch or circuit breaker
- The ESP200 solid-state overload relay has a protective coating on the circuit board which gives it superior protection against high humidity, condensation and corrosive environments
- Combination controllers are available with a disconnect switch or circuit breaker
- Alternator controls included as standard
- Line side shield on disconnect switch to help guard personnel from contact with live parts
- Comprehensive offering of enclosure types including Type 1, 3/3R, 12, 4 painted and 4X stainless steel to meet your application requirements
- Door is removable for ease of installation and maintenance
- Factory and field modifications for custom applications
- UL listed

Class 88 auto transformer type pump controller

Class 88 NEMA reduced voltage pump control panels

Product description and application

The Siemens reduced voltage starter pump controllers are designed for the same applications and environments the Class 87 full voltage starter pump controllers serve. However, these controllers provide added protection for your equipment.

When energized, full-voltage starters can cause excessive pressure surges in centrifugal pumping systems. These pressure surges induce stress in the piping which causes "water hammering." Even worse than the noise produced from the water hammering is the equipment damage that pressure surges may cause. This damage can include, among other things, ruptured pipes, loosened or broken pipe supports and damaged valves. The Siemens NEMA reduced voltage pump controllers are designed to reduce damage to your equipment. This is accomplished by stepping up the motor speed and thus reducing starting torque. A second reason for using reduced voltage controllers is to comply with electrical current restrictions of utility companies.

Siemens manufactures the three commonly used NEMA reduced voltage pump controllers. This consists of the auto transformer, wye-delta and part-winding starters. Each type of starter is designed for specific application requirements. In addition to reducing starting torque, they also reduce inrush current and provide smoother acceleration of the pump.

Features and benefits common to all class starters

- Heavy-duty NEMA starter sizes 1 – 6 including Siemens exclusive half-size starters to provide reliable motor control and protection expected in the most demanding applications
- The ESP200 solid-state overload relay has a protective coating on the circuit board which gives it superior protection against high humidity, condensation and corrosive environments
- Adjustable starting time
- CPT supplied as standard
- Available with a fusible disconnect switch or circuit breaker
- Type 3/3R enclosure which is fully gasketed to ensure a dust tight and water tight seal
- Rugged 30 mm H-O-A switch and Start push button, which are standard features, meet Type 3, 4, 12, and 13 specifications and are oil and dust tight for durability
- Door is removable for ease of installation and maintenance
- Factory and field modifications for custom applications
- UL rated as Service Entrance Equipment permitting equipment to be pole mounted and installed directly off of utility power lines
- UL listed

Heavy duty switches

Features and Benefits

1 Quick-make, quick-break operating mechanism that ensures positive operation.

2 Visible blade, double-break switching action.

3 Arc chutes dissipate heat and prolong switch life.

4 Highly visible red handle grip. Designed for hook stick operation.

5 Defeatable dual cover interlock.

6 Generous top, bottom and side gutters that meet or exceed NEC wire-bending space requirements.

7 Informative door labeling which includes replacement parts list.

8 Side-hinged door that opens past 180° for easier wiring.

9 Unique enclosure design increases rigidity and prevents cuts and scrapes to conductors and installer's hands.

10 Spring reinforced fuse clips that assure reliable contact for cool operation.

11 Door latch securely holds door closed and allows cover padlocking.

12 Front removable mechanical lugs that are suitable for CU/AL 60 or 75° C conductors.

13 Lugs are field convertible to copper body and to a wide variety of compression connectors.

14 Hinged clear line terminal shield with probe holes for inspecting or testing line side terminals

.

15 Drawn cover for increased rigidity and resistance to abuse.

16 Top key hole and bottom mounting holes provide easy two or three point mounting.

Heavy duty switches

Catalog numbering system

H F 3 6 4 N R CU

Switch type
L = General Duty 10k AIC Max. (Plug Fused & 60A Max. Non-Fused)
G = General Duty
H = Heavy Duty
DT = Double Throw
DTG = General Duty DT

Fused or non-fused
F = Fused
NF = Non-Fused

Number of poles
1 = 1
2 = 2
3 = 3
4 = 4
6 = 6

Voltage
1 = 120V or 120/240V
2 = 240V
6 = 600V

Special applications with:
CH = Crouse Hinds Receptacle
CJ = Factory J Fuse Spacings
CR = Class R Clips Installed
CU = Factory Installed Copper Lugs
G = Factory Installed Ground Bar
H = Height or Size Reduced
L = Oversized Enclosure
PN = Pyle National Receptacle
W = Viewing Window

Enclosure type
Omit = Type 1, Indoor
R = Type 3R, Outdoor
S = Type 4/4X, Stainless Steel
J = Type 12, Industrial
X = Type 4/4X, Non-metallic
XL = Type 4/4X, Non-metallic less lugs

With or without neutral
Omit = Less Neutral
N = With Neutral

Amperes
1 = 30A
2 = 60A
3 = 100A
4 = 200A
5 = 400A
6 = 600A
7 = 800A

Accessories numbering system

H N 6 4

Switch type
H = Heavy Duty
G = General Duty

Accessory type
A1 = Auxiliary Switch 1/NO & 1/NC
A2 = Auxiliary Switch 2/NO & 2/NC
A3 = Auxiliary Switch Low Current
CL = Compression Lug Barrier/ Mounting Kit
G = Ground Lug Kit
G2 = Insulated Ground Lug Kit
LC = Copper Lug Kit
N = Neutral
N2 = 200% Neutral
P = Fuse Puller Kit
R = Class R - Fuse Clip Kit
T = Class T - Fuse Kit

Amperes
1 = 30A
2 = 60A
12 = 30/60A
3 = 100A
23 = 60/100A
123 = 30/60/100A
1234 = 30/60-100-200A
4 = 200A
5 = 400A
56 = 100/600A
5678 = 400/600/800/1200A
6 = 600A

Maximum voltage
2 = 240V Max.
6 = 600V Max.

Heavy duty switches

System	Ampere Rating	Indoor - Type 1 Catalog Number	Ship Wgt*	Outdoor - Type 3R Catalog Number	Ship Wgt.*	Horsepower Rating [1] 480 Volt AC 1-Phase, 2-Wire Std.	Max.	3-Phase, 3-Wire Std.	Max.	Horsepower Rating [1] 600 Volt AC 1-Phase, 2-Wire Std.	Max.	3-Phase, 3-Wire Std.	Max.	250 Volt DC	600 Volt DC
600 Volt Fusible															
2-Pole, 2-Fuse [2]														480 Volt AC / 600 Volt AC / 600 Volt DC	
	30	HF261	13	HF261R	13	3	7.5	–	–	3	10	–	–	5	15
	60	HF262	16	HF262R	17	5	20	–	–	10	25	–	–	10	30
	100	HF263	21	HF263R	22	10	30	–	–	15	40	–	–	20	20
	400	HF265	149	HF265R	152	–	50	–	–	50	–	–	–	40	50
	600	HF266	55	HF266R	157	–	50	–	–	50	–	–	–	50	50
3-Pole, 3-Fuse														480 Volt AC / 600 Volt AC / 250 Volt DC [3]	
	30	HF361	13	HF361R	13	3	7.5	5	15	3	10	7.5	20	5	–
	30	HF361L [4]	19	HF361RL [4]	19	3	7.5	5	15	3	10	7.5	20	5	–
	60	HF362	19	HF362R	19	5	20	15	30	10	25	15	50	10	25 [6]
	60	–	–	HF362RL [4]	24	5	20	15	30	10	25	15	50	10	25 [6]
	100	HF363	24	HF363R	24	10	30	25	60	15	40	30	75	20	25 [6]
	200	HF364	44	HF364R	45	25	50	50	125	30	50	60	150	40	50
	400	HF365H [5]	136	HF365RH [5]	137	–	–	100	250	–	–	125	350	50	–
	400	HF365	162	HF365R	162	–	–	100	250	–	–	125	350	50	–
	600	HF366H [5]	138	HF366RH [5]	141	–	–	150	400	–	–	200	500	–	–
	600	HF366	166	HF366R	167	–	–	150	400	–	–	200	500	–	–
	800	HF367	380	HF367R	382	–	–	200	500	–	–	250	500	–	–
	1200	HF368	383	HF368R	385	–	–	200	500	–	–	250	500	–	–
3-Pole, 3-Fuse and Solid Neutral														480 Volt AC / 600 Volt AC / 250 Volt DC [3]	
	30	HF361N	13	HF361NR	15	3	7.5	5	153	10	7.5	20	5	–	–
	60	HF362N	19	HF362NR	20	5	20	15	30	10	25	15	50	10	25 [6]
	100	HF363N	24	HF363NR	26	10	30	25	60	15	40	30	75	20	25 [6]
	200	HF364N	45	HF364NR	50	25	50	50	125	30	50	60	150	40	50
	400	HF365N	171	HF365NR	162	–	–	100	250	–	–	125	350	50	–
	600	HF366N	172	HF366NR	165	–	–	150	400	–	–	200	500	–	–
	800	HF367N	382	HF367NR	386	–	–	150	400	–	–	200	500	–	–
	1200	HF368N	385	HF368NR	388	–	–	150	400	–	–	200	500	–	–
600 Volt Fusible (For 2-pole applications use outside poles of 3-pole switches)															
2-Pole, 2-Fuse [2]														480 Volt AC / 600 Volt AC / 600 Volt DC	
		Type 4/4X Stainless Std. Cat. No.	Window Switch Cat. No.	Ship Wgt.	Type 12 Industrial Std. Cat. No.	Window Switch Cat. No.	Ship Wgt.								
	30	HF261S	–	17	HF261J	–	13	3	7.5	–	–	3	10	–	–	5	15
	60	HF262S	–	23	HF262J	–	22	5	20	–	–	10	25	–	–	10	30
	100	HF263S	–	29	HF263J	–	27	10	30	–	–	15	40	–	–	20	50
	400	HF265S	–	170	HF265J	–	165	–	50	–	–	50	–	–	–	40	50
	600	HF265S	–	170	HF265J	–	166	–	50	–	–	50	–	–	–	50	50
3-Pole, 3-Fuse														480 Volt AC / 600 Volt AC / 250 Volt DC [3]	
	30	HF361S	HF361SW	17	HF361J	HF361JW	173		7.5	5	15	–	–	7.5	20	5	–
	60	HF362S	HF362SW	23	HF362J	HF362JW	22	5	20	15	30	–	–	15	50	10	25 [6]
	100	HF363S	HF363SW	29	HF363J	HF363JW	26	10	30	25	60	–	–	30	75	20	25 [6]
	200	HF364S	HF364SW	56	HF363J	HF364JW	53	25	50	50	125	–	–	60	150	40	50 [6]
	400	HF365S	HF365SW	173	HF365J	HF365JW	166	–	–	100	250	–	–	125	350	50	–
	600	HF366S	–	175	HF366J	HF366JW	168	–	–	150	400	–	–	200	500	–	–
	800	HF367S	–	380	HF367J	–	380	–	–	200	500	–	–	250	500	–	–
	1200	HF368S	–	–	HF368J	–	384	–	–	200	500	–	–	250	500	–	–

* In pounds (lbs).
1 Dual horsepower ratings: Std. - applies when non-time delay fuses are installed. Max. - applies when time-delay fuses are installed.
2 Use 3-pole switch for 200A applications.
3 60-200A, 3-pole switches are also rated 600V DC.
4 Indicates oversized enclosure (30A switch in a 60A enclosure or a 60A switch in a 100A enclosure).
5 Height reduced switch with 500 MCM max. wire bending space.
6 600V DC rating and 600V DC HP rating requires two poles to be connected in series.




System	Amp. Rtg.	Indoor - Type 1 Catalog Number	Ship Wgt.*	Outdoor - Type 3R Catalog Number	Ship Wgt.*	Horsepower Ratings 240 Volt 1-phase	240 Volt 3-phase	480 Volt 1-phase	480 Volt 3-phase	600 Volt 1-phase	600 Volt 3-phase	250V DC	600V DC
600 Volt Non-Fusible (Also used for 240V applications)													
2-Pole [4]												480 Volt AC / 600 Volt AC / 600 Volt DC	
	30	HNF261	11	HNF261R	11	–	–	7.5	–	10	–	5	15
	60	HNF262	16	HNF262R	18	–	–	20	–	25	–	10	30
	100	HNF263	19	HNF263R	20	–	–	30	–	40	–	20	50
	400	HNF265	126	HNF265R	129	15	–	50	–	50	–	40	50
	600	HNF266	127	HNF266R	129	15	–	50	–	50	–	50	50
3-Pole												480 Volt AC / 600 Volt AC / 250 Volt DC [1]	
	30	HNF361	12	HNF361R	13	3	10	7.5	20	10	30	5	–
	30	–	–	HNF361RL [3]	19	3	10	7.5	20	10	30	5	–
	60	HNF362H [2]	12	HNF362RH [2]	13	10	20	20	50	10	40	5	–
	60	HNF362	18	HNF362R	19	10	20	20	50	25	60	10	25 [5]
	60	–	–	HNF362RL [3]	24	10	20	20	50	25	60	10	25 [5]
	100	HNF363	23	HNF363R	24	15	40	30	75	40	100	20	25 [5]
	200	HNF364	42	HNF364R	43	15	60	50	125	50	150	40	50 [5]
	400	HNF365	132	HNF365R	129	15	125	50	250	50	350	50	–
	600	HNF366	133	HNF366R	130	15	200	50	400	50	500	–	–
	800	HNF367	302	HNF367R [4]	305	15	250	50	500	50	500	–	–
	1200	HNF368	305	HNF368R [4]	307	15	250	50	500	50	500	–	–

	Amp Rtg.	Type 4/4X Stainless Standard Cat. No.	Window Switch Cat. No.	Ship Wgt.	Type 12 Industrial Standard Cat. No.	Window Switch Cat. No.	Ship Wgt.	Horsepower Ratings 240V 1 Ph.	240V 3 Ph.	480V 1 Ph.	480V 3 Ph.	600V 1 Ph.	600V 3 Ph.	250V DC	600V DC
2-Pole [4]														480 Volt AC / 600 Volt AC / 600 Volt DC	
	30	HNF261S	–	15	HNF261J	–	13	–	–	7.5	–	10	–	5	15
	60	HNF262S	–	24	HNF262J	–	21	–	–	20	–	25	–	10	30
	100	HNF263S	–	28	HNF263J	–	25	–	–	30	–	40	–	20	50
	400	HNF265S	–	137	HNF265J	–	122	15	–	50	–	–	–	40	50
	600	HNF266S	–	138	HNF266J	–	128	15	–	50	–	–	–	50	50
3-Pole														480 Volt AC / 600 Volt AC / 250 Volt DC [1]	
	30	HNF361S	HNF361SW	15	HNF361J	HNF361JW	14	3	10	7.5	20	10	30	5	–
	60	HNF362SH [2]	–	15	HNF362JH [2]	–	15	10	20	20	50	10	40	5	–
	60	HNF362S	HNF362SW	23	HNF362J	HNF362JW	19	10	20	20	50	25	60	10	25 [5]
	100	HNF363S	HNF363SW	27	HNF363J	HNF363JW	25	15	40	30	75	40	100	20	25 [5]
	200	HNF364S	HNF364SW	55	HNF364J	HNF364JW	51	15	60	50	125	50	150	40	50 [5]
	400	HNF365S	HNF365SW	133	HNF365J	HNF365JW	129	15	125	50	400	50	500	–	–
	600	HNF366S	–	134	HNF366J	–	130	15	200	50	500	50	500	–	–
	800	HNF367S	–	302	HNF367J	–	302	15	250	50	500	50	500	–	–
	1200	HNF368S	–	308	HNF368J	–	308	15	250	50	500	50	500	–	–

* In pounds (lbs.)
1 60-200A three-pole switches are also rated 600V DC.
2 Compact switch with 100,000 RMS symmetrical short circuit rating.
3 Indicates oversized enclosure (30A switch in a 60A enclosure or a 60A switch in a 100A enclosure).
4 Use three-pole switch for 200A application.
5 600V DC rating and 600V DC HP rating requires two poles to be connected in series.

Published by Siemens Industry, Inc. 2016.

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Order No.NEBR-PUMPS-0216
Printed in U.S.A.