



## Vertical Multistage





## AN INTRODUCTION TO NAFFCO

NAFFCO was founded in Dubai, UAE to become the world's leading producer and supplier of life safety solutions. By recognizing the importance and convenience of having easy access to multiple safety services, we became specialized by offering complete solutions under one roof for all types of high quality firefighting equipment, fire protection systems, fire alarms, addressable emergency systems, security systems, custom-made vehicles such as fire trucks, ambulances, mobile hospitals and airport rescue firefighting vehicles (ARFF).

With the most talented and dedicated employees from around the world, NAFFCO has over 450 passionate engineers and over 3 million square feet of manufacturing facilities. We are currently exporting to over 100 countries worldwide.

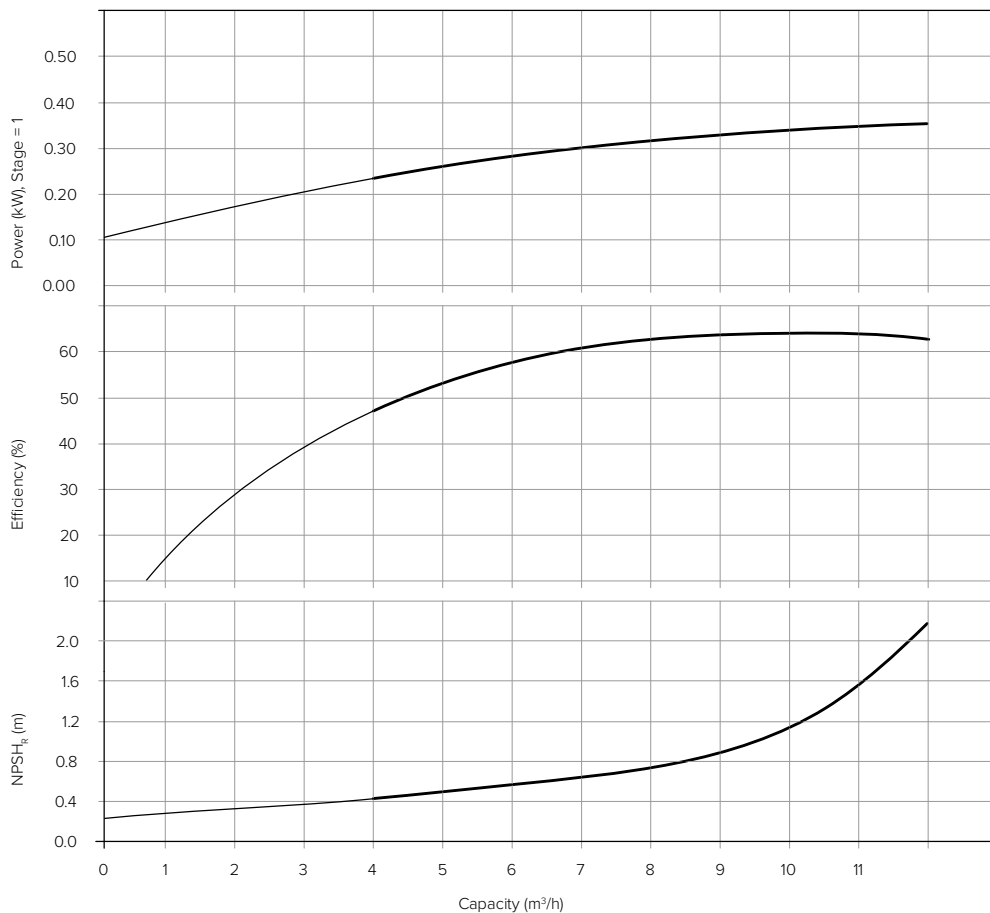
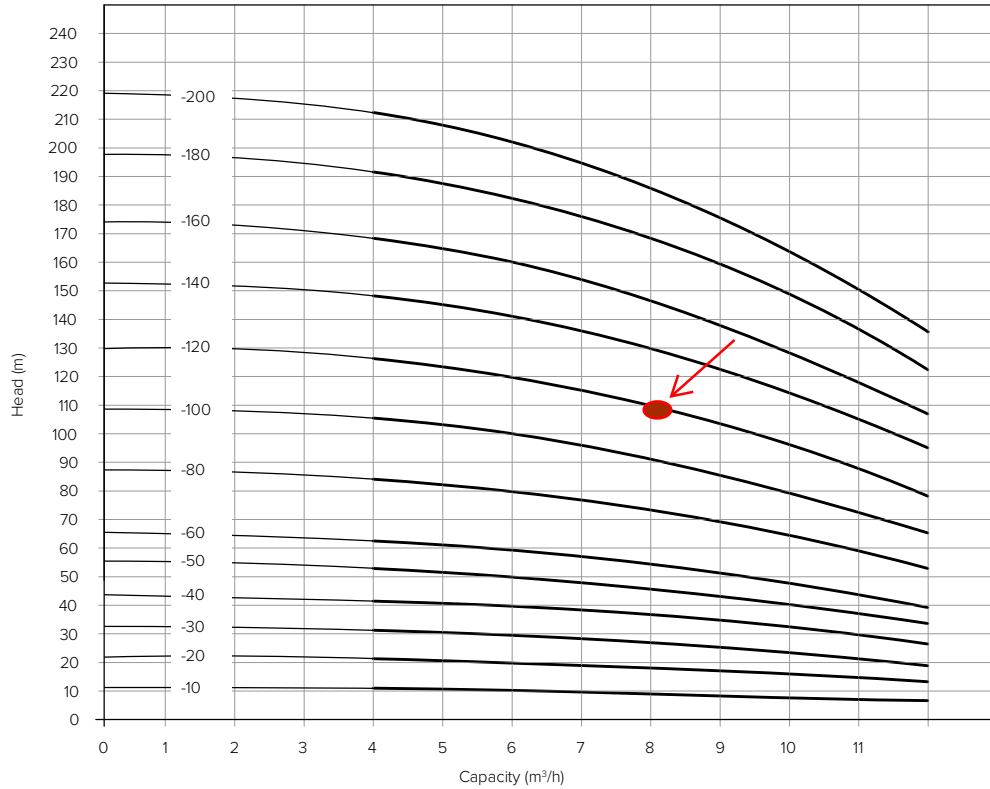
Our products have been consistently certified by UL, FM, BSI, LPCB and Global Mark according to the latest International Quality Standard for their strict adherence to ISO 9001 quality management system and certified for ISO 14001 environmental management systems and BS OHSAS 18001 for occupational safety by UL DQS.

Our success is driven by our passion to protect; our vision is to become the world's number one provider of innovative solutions in protecting life, environment and property.

## PERFORMANCE CURVES

### → NF-VL 8

50Hz  
2900rpm



# NAFFCO VERTICAL MULTISTAGE PUMPS

NF-VL / NF-VLS is a vertical multistage in-line pump series with all wetted parts made of stainless steel. It is suitable for a variety of different applications involving various liquids from potable water to industrial effluent and cover a wide range of flow and pressure requirements.

The major features of this series pumps are efficient operation, low noise, compact structure, light weight, easy to service, good seal performance etc. Its high head low capacity performance range makes it especially suit-

able for using as a pressure maintenance pump (Jockey Pump) in firefighting applications and it meets NFPA 20 requirements for Jockey Pumps. Each pump set is tested in our factory, prior to dispatch, to confirm that the performance is achieved per the specified requirements.

- Reliable Performance
- Stringent Tests
- Easy to Service
- Quality Materials
- Efficient Operation
- Longer Service Life

## READING THE MODEL NAME

Example: NF-VL 4-120

**NF** - Series Name

**VL** - Vertical Multistage

**4** - Nominal Capacity in m<sup>3</sup>/hr

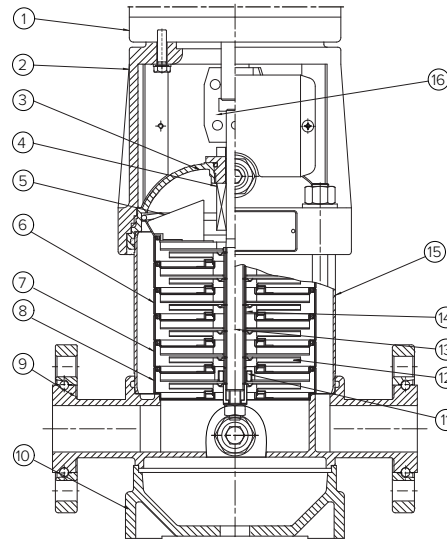
**120** - Number of Stages x 10

Note: Letter 'S' will be added to 'VL' for the models that are designed for 60 Hz operation.

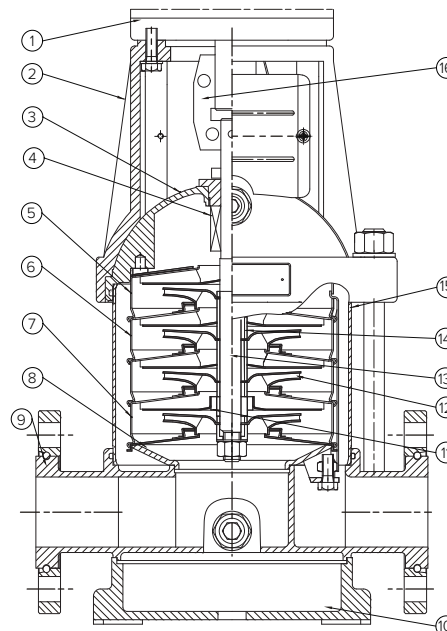
SL. NO.	PART NAME	MATERIAL	STANDARD
1	Electric Motor	Aluminum Frame	
2	Driver Pedestal (Motor Base)	Cast iron	ASTM A48 Class 25 B
3	Seal Base	Stainless Steel	AISI 304
4	Mechanical Seal	Tungsten Carbide / Graphite	
5	Top Diffuser	Stainless Steel	AISI 304
6	Diffuser	Stainless Steel	AISI 304
7	Support Diffuser	Stainless Steel	AISI 304
8	Inducer	Stainless Steel	AISI 304
9	Suction & Discharge Chamber	Stainless Steel	AISI 304
10	Pump Base Plate	Cast Iron	ASTM A48 Class 25 B
11	Bearing	Tungsten Carbide	
12	Impeller	Stainless Steel	AISI 304
13	Shaft	Stainless Steel	AISI 304
14	Impeller Sleeve	Stainless Steel	AISI 304
15	Outer Sleeve (Cylinder)	Stainless Steel	AISI 304
16	Coupling	Carbon Steel	AISI 1040
17	O ring	FPM	
18	Flanges	Cast Iron	ASTM A48 Class 35 B

Table 1

## CROSS SECTIONAL DRAWING



NF-VL(S) 4



NF-VL(S) 8, 16

## SPECIFICATIONS

### LIQUID DATA

Pumped Liquid Type	: Thin, clean and non-aggressive, non-explosive liquids, not containing solid particles or fibers.
Liquid pH range	: pH 5-9
Temperature Range	
Standard Design	: -15°C to +90°C
Hot water Design	: -15°C to +120°C

### ELECTRIC MOTOR DATA

Enclosure	: V18 ("C" Type Face at Drive End) < 4 kW  V1 ("D" Type Flange at Drive End) > 5.5 kW  Shaft Down, No Feet
Standard	: IEC 60034
Voltage	: 380-415 V 460 V
Phase	: 3
Frequency	: 50 / 60 Hz
Insulation Class	: F
Enclosure IP Rating	: IP55
Efficiency Class	: Eff. 2
Noise Level	: 85 dB(A) @ 1 m.
Ambient Temperature	: Standard: 40°C  High: 50°C with 0.95 & 55°C with 0.92 derating factors (for other temperatures refer the below Curve No. 1)
Ambient Temperature	: Standard: 1000 m  High: 2250 m with 0.95 & 3500 m with 0.88 derating factors (for other altitudes refer the temperature derating curve)

### PUMP DATA

Pump Design Test Standard	: ISO 9906
Nozzle Connections	: Flanged
Nozzle Connection Design Standard	: EN 1092-2
Flange Rating and Type	: Refer Table of Dimensions
ANSI/HI 2.1-2.2 Designation	: Vertical in-line casing diffuser pump (VS8)
Pump Bearing Lubrication	: Pumped Liquid
Shaft Shape (for securing impeller on to the shaft)	: Double-D
Mechanical Seal	: Cartridge Type
Minimum Suction Pressure Required	: Refer the NPSH Curve of the corresponding pump model
Maximum Suction Pressure	: Please refer the below Table No. 2

Pump Model	Maximum Suction Pressure (bar)
50 Hz	
NF-VL 4-10 – NF-VL 4-20	6
NF-VL 4-30 – NF-VL 4-100	10
NF-VL 4- 0 – NF-VL 4- 0	1
NF-VL 8-10 – NF-VL 8-70	6
NF-VL 8-80 – NF-VL 8-200	10
NF-VL 16-20 – NF-VL 16-30	6
NF-VL 16-40 – NF-VL 16-160	10
60 Hz	
NF-VLS 4-20	6
NF-VLS 4-30 – NF-VLS 4-80	10
NF-VLS 4-100 – NF-VLS 4-160	15
NF-VLS 8-10 – NF-VLS 8-50	6
NF-VLS 8-60 – NF-VLS 8-140	10
NF-VLS 16-10 – NF-VLS 16-20	6
NF-VLS 16-30 – NF-VLS 16-100	10
<b>Table 2</b>	



Serving Over 100 Countries Worldwide



**NAFFCO**

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[www.naffco.com](http://www.naffco.com)

In line with NAFFCO policy for continuous product development,  
NAFFCO has the right to change specifications without prior notice.





# UL LISTED JOCKEY PUMP CONTROLLER

## MODEL NFY-JSD1 REDUCED VOLTAGE/ STAR - DELTA (OPEN TRANSITION)

## MODEL NFY-JDO1 DIRECT ON LINE

NAFFCO Jockey Pump Controllers for fire pumps are listed by Underwriters Laboratories (UL file number E309408), in accordance with UL508a (Standard for Industrial Control Panel), NFPA70 (National Electric Code) and NEMA.

Power ratings vary from 1.5 to 40 horsepower, 380 to 415 volts, 50 or 60 Hz. Only high quality UL listed or

UL recognized components are used in these panels to guarantee the best possible reliability. Also high quality UL listed enclosures are used.

The controller is completely wired, assembled and tested at the factory before shipment, and ready for immediate installation.

### STANDARD FEATURES

- Main disconnected switch with rotary handle, sized for disconnecting motor horsepower and voltage.
- Motor Starter rated to motor's horsepower, with thermal and short circuit protection.
- Rated motor contactors.
- Circuit breaker for protection of control circuit.
- Selector switch for Hand—Off—Automatic operation.
- Star—Delta starting timer. ( in Model NFY-JSD1 )
- Power ON/Healthy indicator/free contact.
- Pump Run indicator/free contact.
- Pump Trip indicator/free contact.
- Adjustable pressure switch.
- UL listed enclosure.

### SEQUENCE OF OPERATION

This controller is working under three modes automatic off and manual mode.

### OFF (RESET) MODE

In this mode, the controller is considered to be off and can't start the Jockey pump.

### AUTOMATIC START

In this mode, controller will start the Jockey pump automatically and directly at low pressure detection by the pressure switch, and will stop the pump automatically and directly when the pressure goes up again.

### MANUAL START

In this mode, controller will start the Jockey pump directly, and will not stop until selector switch is switched off or in Auto mode.







#### RATING

POWER (HP)	RATED VOLTAGE (VAC)	FREQUENCY (Hz)	RATED CONTENT (A)	SHORT CIRCUIT CURRENT (kA)	ENCLOSED SIZE (mm)
1.5	380 - 415	50 or 60	3.3	5	500(H) x 400(W) x 250(D)
2	380 - 415	50 or 60	4.3	5	500(H) x 400(W) x 250(D)
3	380 - 415	50 or 60	6.1	5	500(H) x 400(W) x 250(D)
5	380 - 415	50 or 60	9.7	5	500(H) x 400(W) x 250(D)
7.5	380 - 415	50 or 60	14	5	500(H) x 400(W) x 250(D)
10	380 - 415	50 or 60	18	5	500(H) x 400(W) x 250(D)
15	380 - 415	50 or 60	27	5	500(H) x 400(W) x 250(D)
20	380 - 415	50 or 60	34	5	500(H) x 400(W) x 250(D)
25	380 - 415	50 or 60	44	5	600(H) x 500(W) x 250(D)
30	380 - 415	50 or 60	51	5	600(H) x 500(W) x 250(D)
40	380 - 415	50 or 60	66	5	600(H) x 500(W) x 250(D)

Table (7)

# Jockey Pump Controller

Direct On Line

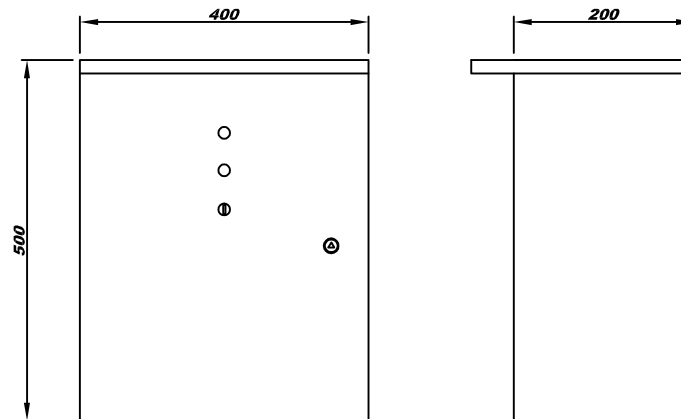
Enclosure

Model: NFY-JD01

Version: 1.0

Enclosure for 1.5 To 20 HP Controllers

Enclosure Model:  
NFY-50-40-25-J



## TECHNICAL DATA :

S.NO.	DESCRIPTION		DATA
1.	SIZE		500(HEIGHT)X400(WIDTH)X200(DEPTH)
2.	MATERIAL		1.5 mm THICK. GI
3.	PAINT FINISH		RAL 301 POWDER COATED
4.	DOOR LOCK		TRIANGULAR LOCK WITH KEY
5.	HINGES		2 BUSH PIN HINGES 60 MM
6.	DOOR OPENING	FRONT	RIGHT HAND SIDE TO LEFT HAND SIDE
		BACK	Non
7.	DOOR OPENING ANGLE		120°
8.	ALL DIMENSIONS ARE IN MM		
9.	PROTECTION RATING		NEMA 2
10.	BASE PLATE		FRONT

FIRE PROTECTION BY



**NAFFCO**

WORLD LEADERS IN FIRE PROTECTION SYSTEMS

NATIONAL FIRE FIGHTING MANUFACTURING CO. LTD.  
P.O. BOX 17014, DUBAI - U.A.E. TEL.: 04-8815653 FAX: 04-8816229  
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Client :

Title / Name :

Jockey Fire Pump Controller

Designed By : **Eng. Yousef Abu Hadhoud**

Approved By : **Eng. Emad Kassab**

Drawing No :

Date :

02/08/2008

Panel Model No : NFY-JD01

Version: 1.0

Panel Serial No :

Page Description :

Enclosure

Sheet

1 of 4

# Jockey Pump Controller

Direct On Line

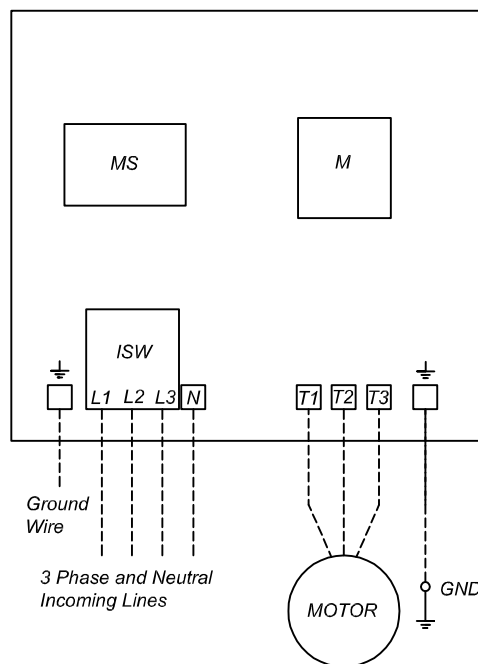
Panel Layout

Model: NFY-JD01

Version: 1.0

## Power Circuit Layout

Controller  
Internal Layout



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Jockey Fire Pump Controller

Designed By : **Eng. Yousef Abu Hadhoud**

Approved By : **Eng. Emad Kassab**

Drawing No :

Date :

02/08/2008

Panel Model No : NFY-JD01

Version: 1.0

Panel Serial No :

Page Description :

Motor Power Circuit

Sheet

2 of 4

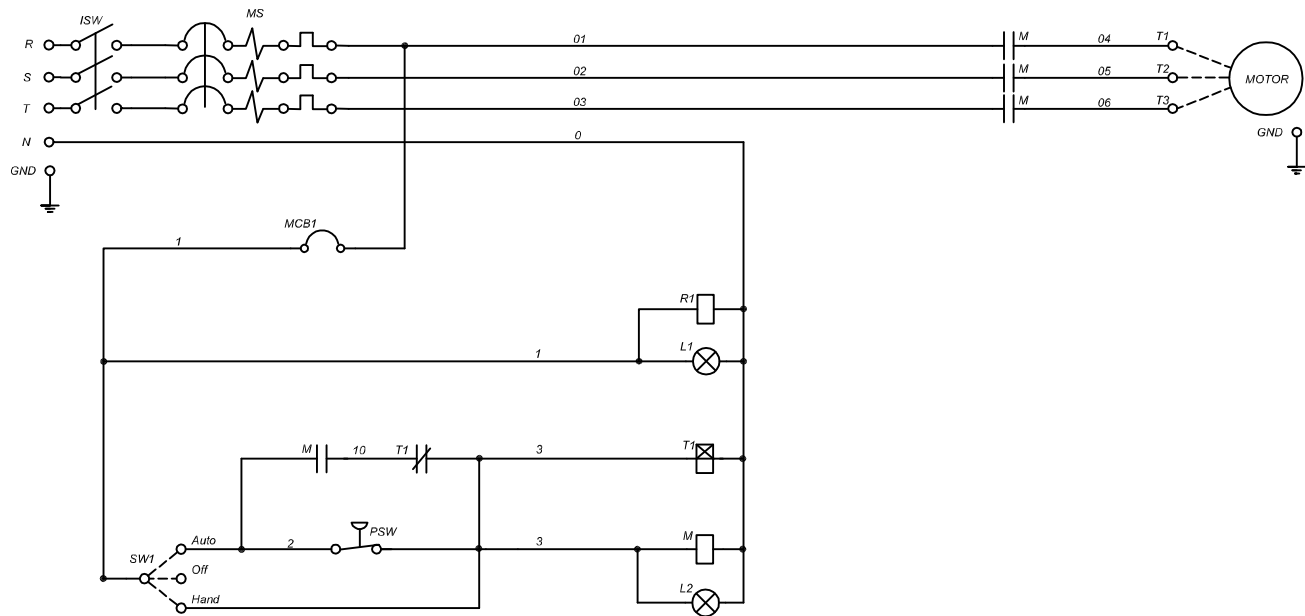
## Jockey Pump Controller

Direct on line connection (D.O.L)

### Wiring Schematic

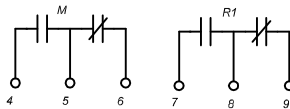
Model: NFY-JD01

Version: 2.0



**ISW: Isolator switch**  
**MS: Motor Starter**  
**M: Main motor contactor**  
**MCB1: 1 pole miniature circuit breaker**  
**SW1: Auto. - Off - Hand selector switch**  
**PSW: Pressure switch (N.C at low pressure)**  
**L1: Power on indicator**  
**L2: Motor run indicator**  
**R1: Auxiliary Trip Relay**  
**T1: Holding Timer**

### Relays free contacts Terminal Blocks



**Note:**  
For Free Contacts and Contol remote wiring,  
use 14 - 12 AWG (2.5 - 4 mm) wires

**Jumpers:**  
J1: Disconnect to activate deluge valve  
J2: Disconnect to activate automatic stop

# Jockey Pump Controller

Direct on line connection (D.O.L)

Field Wiring

Model: NFY-JD01

Version: 1.0

## Copper Wire Sizes for Controller Model NFY-JD01

Motor  Power  [HP]	Line Terminal Wire Size Per Phase				Output Motor Wire Siz Per Phase				Ground Wire			
	Min		Max		Min		Max		Min		Max	
	AWG or MCM	mm Sq.	AWG or MCM	mm Sq.	AWG or MCM	mm Sq.	AWG or MCM	mm Sq.	AWG or MCM	mm Sq.	AWG or MCM	mm Sq.
1.5	16	1.3	8	8.4	16	1.3	8	8.4	8	8.4	6	13.3
2	16	1.3	8	8.4	16	1.3	8	8.4	8	8.4	6	13.3
3	14	2.1	8	8.4	14	2.1	8	8.4	8	8.4	6	13.3
5	14	2.1	8	8.4	14	2.1	8	8.4	8	8.4	6	13.3
7.5	14	2.1	8	8.4	14	2.1	8	8.4	8	8.4	6	13.3
10	12	3.3	8	8.4	12	3.3	8	8.4	8	8.4	6	13.3
15	10	5.3	6	13.3	10	5.3	6	13.3	8	8.4	6	13.3
20	8	8.4	6	13.3	8	8.4	6	13.3	8	8.4	6	13.3
25	8	8.4	6	13.3	8	8.4	6	13.3	8	8.4	6	13.3
30	6	13.3	6	13.3	6	13.3	6	13.3	6	13.3	1/0	53.5
40	4	21.2	1	42.4	4	21.2	1	42.4	4	21.2	1/0	53.5

## Tightening Torque

AWG OR CIRCULAR MILL SIZE	TIGHTENING TORQUE USING EXTERNAL DRIVE WRENCH	
	LP.In	N.m
14	75	8.5
12	75	8.5
10	75	8.5
8	75	8.5
6	110	12.4
4	110	12.4
2	150	16.9
1	150	16.9
1/0	180	20.3
2/0	180	20.3
3/0	250	28.2
4/0	250	28.2
250	325	36.7
350	325	36.7
500	375	42.4
600	375	42.4
700	375	42.4
750	375	42.4
800	500	56.5
1000	500	56.5



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