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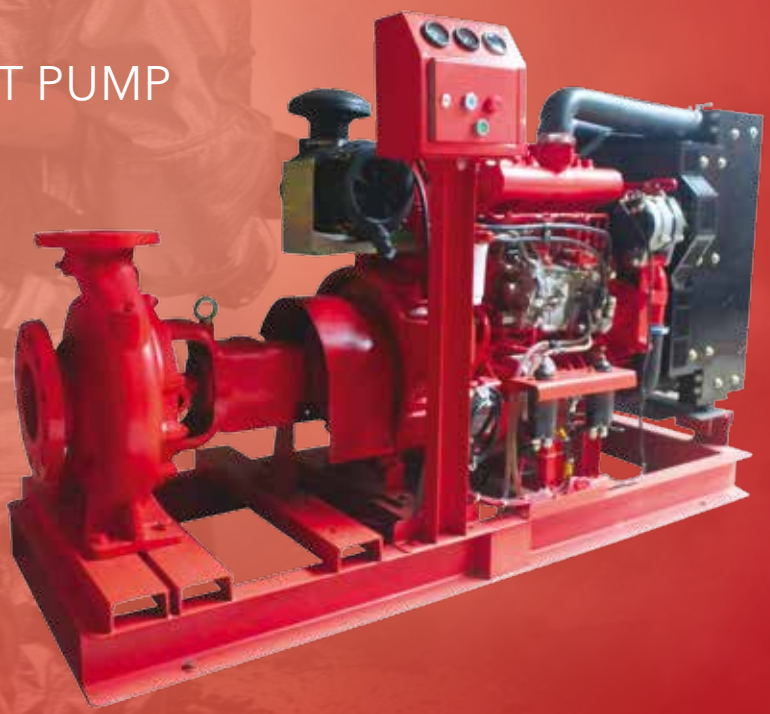
NFPA®

We deliver a unique combination of professional engineering and knowledge

Fire Pump **System**

FIRE FIGHTING/HYDRANT PUMP
COMPLY TO NFPA 20Std



MCKARLEN

FIRE FIGHTING/ HYDRANT PUMP COMPLY TO NFPA 20Std

A fire fighting/hydrant pump is a device that provides the required water flow and pressure for a fire protection system.

A fire fighting/hydrant pump is a complex piece of equipment. We ensure that all the individual components and the system are working properly as intended before they are delivered. The fire pump unit itself consists of pumps, electric motors or diesel engine, base frame and a control panel. Fire protection pumps are normally offered as a complete package that includes the following: **Main Pump Sets, Standby Pump Sets, Jockey Pump Sets.**

CONTENT

Fire Protection System

We offer a wide range of pumps and pumping solutions that ensure the optimum benefit and comfort for your industrial and commercial buildings.

The building services industry refers to the design, installation and maintenance of systems required for commercial properties. McKarlen Fire Protection provides high quality, independent technical advice and support to help identify the best fire and safety solution for you.

Our team of engineers are always up to date with the latest and changes to Building Regulations and Fire Standards, with a detailed appreciation of the consequences for new and existing buildings.

McKarlen has been supplying building services solutions for so many years. We understand the importance of reliable equipment in the building services market. Our experience in the industry enables us to specify and source quality pumping solutions that meet the requirements of the application.

MAIN PUMP SETS

Electric Motor Fire Fighting Pump Complete with Control Panel

PUMP MODEL :

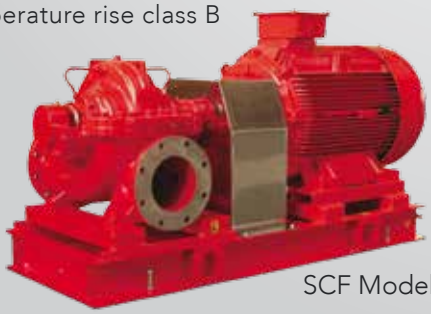
- **ESF MODEL-END SUCTION CENTRIFUGAL (250-1000 US GPM & 130 MTR)**
- **SCF MODEL-SPLIT CASE CENTRIFUGAL (750-2500 US GPM & 160 MTR)**

SPECIFICATION OF PUMP & ELECTRIC MOTOR :

- Comply to NFPA 20Std
- ESF Model or SCF Model (Depend of flow rate)
- Working pressure, max. 25 bar
- Inlet pressure, max. 6 bar
- Inlet & outlet diameter, DN32 to DN250
- Material of casing & impeller, cast iron:
- Enclosure IP55/380V-415V
- Rated speed 2900 Rpm
- Frequency 50Hz
- Insulation class F
- Temperature rise class B

SPECIFICATION OF CONTROL PANEL :

- Emergency handle
- Indicator lamp power on
- Indicator lamp phase reversal
- Push Button pump on
- Push Button pump off
- Selector Breaker on-off
- Ampere meter
- Automatic operation by pressure switch



SCF Model

ESF Model

STAND BY PUMP SETS

Diesel Engine Fire Fighting Pump Complete with Control Panel

PUMP MODEL :

- **ESF MODEL-END SUCTION CENTRIFUGAL (250-1000 US GPM)**
- **SCF MODEL-SPLIT CASE CENTRIFUGAL (750-2500 US GPM)**

SPECIFICATION OF PUMP & DIESEL ENGINE :

- Comply to NFPA 20Std
- ESF Model or SCF Model (Depends on flow rate)
- Working pressure, max. 25 bar
- Inlet pressure, max. 6 bar
- Inlet & outlet diameter, DN32 to DN250
- Material of casing & impeller: cast iron

- 2 starter with selenoid
- 2 set battery/accu
- Radiator cooling system
- Air system intake & exhaust system
- Mechanical governor
- Rated speed 2900 Rpm
- Stater motor DC12V/ DC24V
- Temperature indicator
- Oil pressure indicator
- Ampere indicator

SPECIFICATION OF CONTROL PANEL

- 2 Push Button engine on (Starter-1 & starter-2)
- Battery/accu charger
- Indicator lamp power on
- Indicator lamp engine trip
- Indicator lamp engine on
- Push Button engine off
- Push Button alarm stop
- Buzzer
- Ampere meter battery/accu
- Volt meter battery/accu
- Selector Auto-Manual-Off
- Automatic operation by pressure switch

JOCKEY PUMP SETS

Pump Complete with Control Panel

PUMP MODEL :
• HCR MODEL-VERTICAL INLINE PUMP (10-100 US GPM)

SPECIFICATION OF PUMP & ELECTRIC MOTOR :

- HCR Model
- Working pressure, max. 25 bar
- Inlet pressure, max. 6 bar
- Inlet & outlet diameter, DN25 to DN100
- Material of chamber& impeller, SS 304

- Enclosure IP55/380V-415V
- Rated speed 2900 Rpm
- Frequency 50Hz
- Insulation class F
- Temperature rise class B

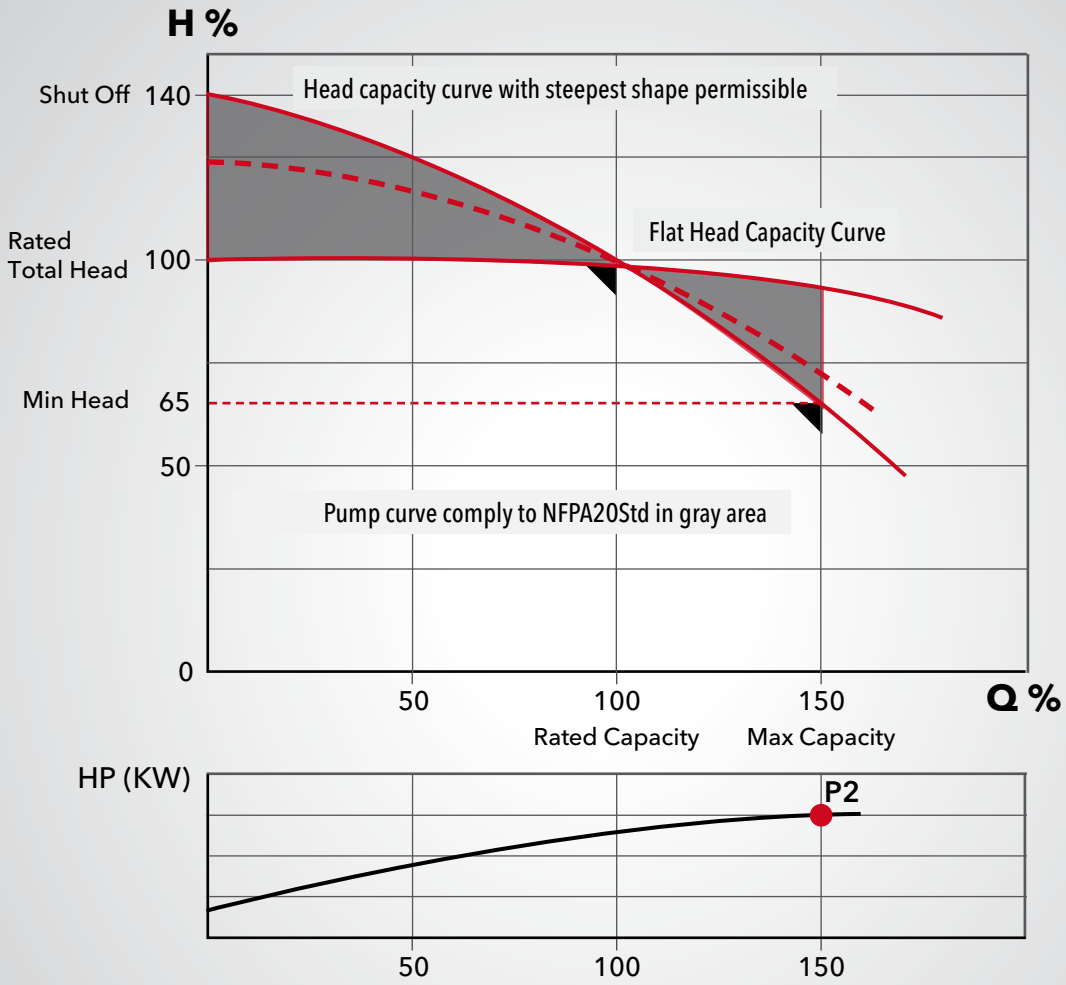
HCR Model

SPECIIFICATION OF CONTROL PANEL :

- Indicator lamp power on
- Indicator lamp pump on
- Indicator lamp pump trip
- Push Button pump on
- Push Button pump off
- Selector switch auto-manual
- Selector breaker on-off
- Automatic operation by pressure switch

PUMP CURVE

COMPLY TO NFPA 20Std



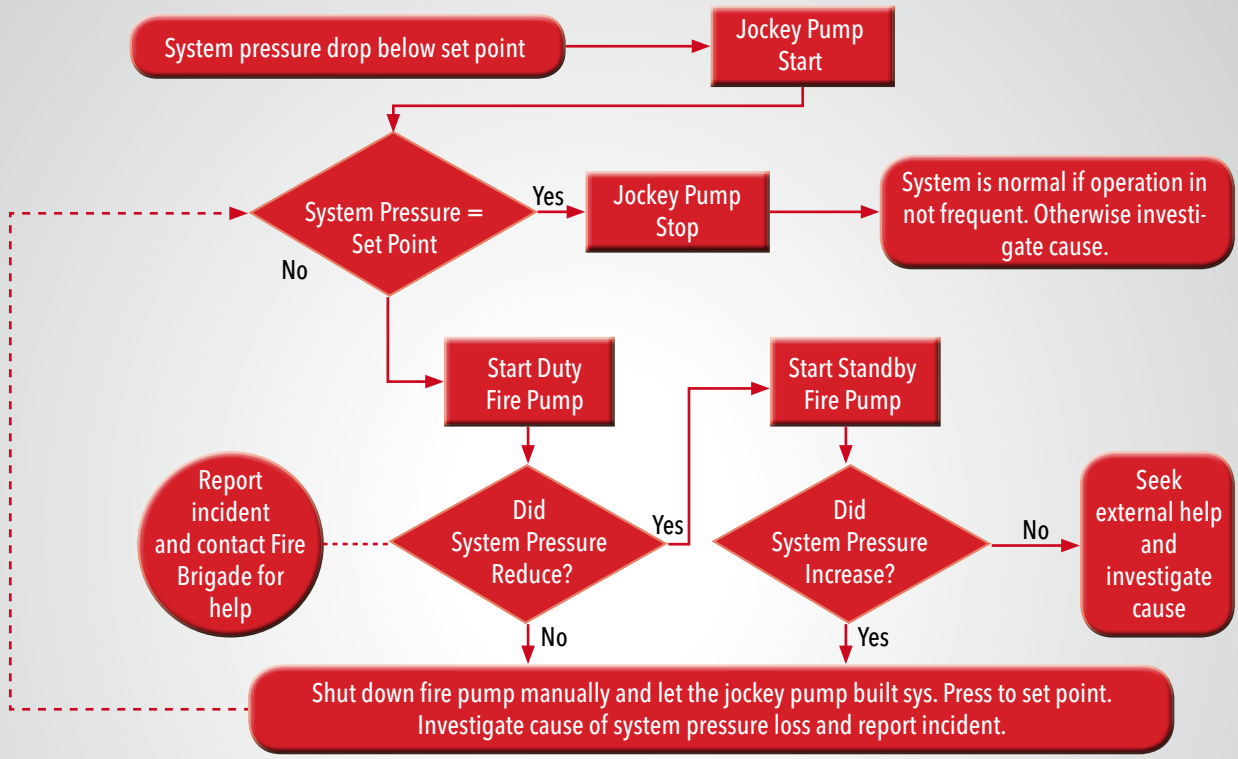
We have strictly selected the pumps that are used for fire fighting applications by meeting the requirements of NFPA 20Std.

20Std NFPA requires that the pump curve that is used for fire fighting should reach the maximum capacity of 150% where the rated capacity is 100% and the total head must be a minimum of 65% and shut off must be 140% of the rated total head 100% (See DWG-1)

Pump power (P2) must be selected at the maximum point capacity of 150%, and the next motor input power is set (P1 = P2 / η motor).

A fire fighting/hydrant pump is a device that provides the required water flow and pressure for a fire protection system.

FIRE FIGHTING PUMP
OPERATION FLOW CHART



In order for fire fighting pump to work in accordance to the flow chart operation (Dwg-2), the settings of a jockey pump pressure switch , duty/main fire pump and standby pump needs to be synchronized so that all the three pumps will work according to its function. The settings of the three pumps pressure switch are as follows:

PUMP-ON :

- PS1 >PS2 & PS3 (See to pump curve)
- PS2 >PS3 (See to pump curve)

PUMP-OFF

- PS1 (Jockey pump) : See to pump curve.
  Pump shut down by automatic
- Electric fire pump (Main/duty pump) :
  Shut down by manually
- Diesel engine fire pump (Stand by pump) :
  Shut down by manually

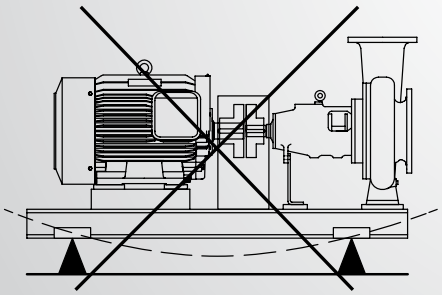
Note :
PS1: Pressure switch-Jockey pump, PS2: Pressure switch-Electric fire pump, PS3: Pressure switch-Diesel engine fire pump

How to install the pumps and eliminate the vibration

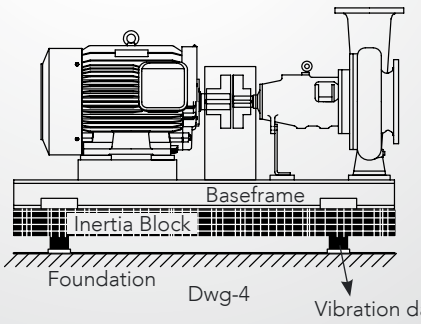
Installation of pumps on the foundation (with power>7.5 kw) need specially attention, this is to avoid high vibration and noise occurring due to the effect of rotation of the pump motor. So to avoid vibration and noise we need to install vibration damper (Spring type or rubber types). However, the installation of vibration dampers must be done correctly, so it will not cause further damage due to deflection on pump baseframe that will affect the alignment of the pump and the motor shaft (See Dwg-3). The correct installation of vibration damper is shown in Dwg-4, where the pump baseframe is riveted by Inertia Block that weighs 1.5 times the weight of the pump set, then the inertia block is riveted by the vibration damper with ≥ 4 units.

When the installation is performed without vibration damper pump, the pump sets to be placed in the foundation and then at anchor, but the pumps baseframe need to be filled with grouting, (See DWG-5a & 5b).

Note:
- Maximum allowable vibration is as follows, Pumps with electric motors is max.8 mm/sec with a max. rotation of 6000 rpm.
- Pumps with diesel engine 4 cyl. is max. 17 mm/sec with a max. rotation of 10,000 rpm.
- Pumps with ≥ 6 cyl diesel engine is the max. 14 mm/sec with a max. rotation of 10,000 rpm.

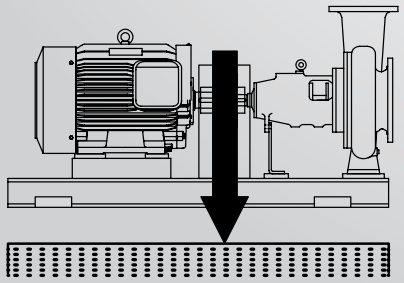


Dwg-3

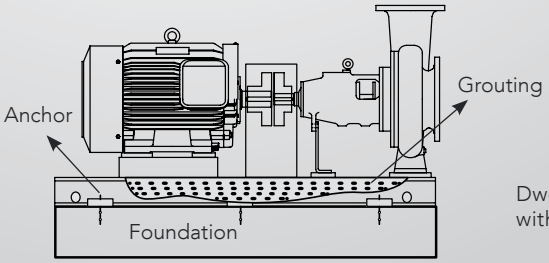


Dwg-4

Dwg.3 & 4 : Pump installation with vibration damper



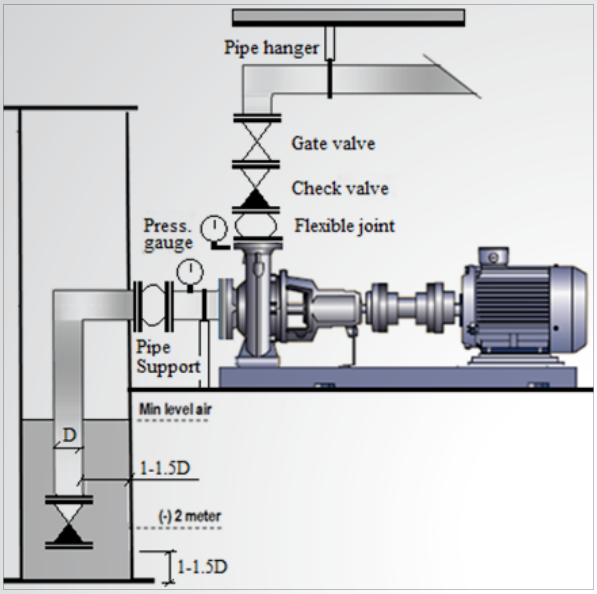
Dwg-5a



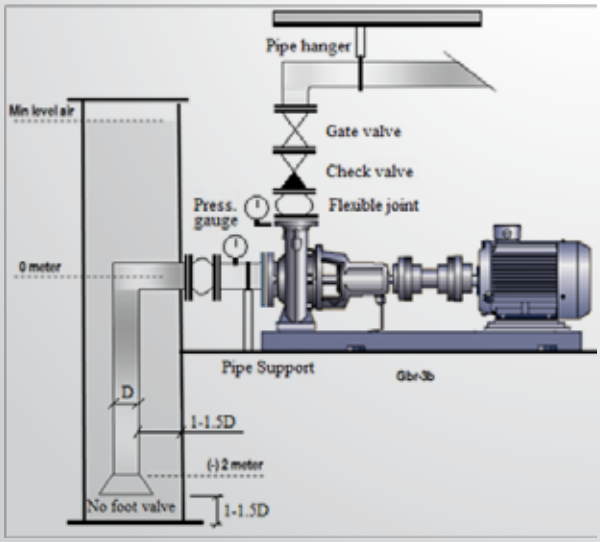
Dwg-5b

Dwg.5a & 5b : Pump installation without vibration damper

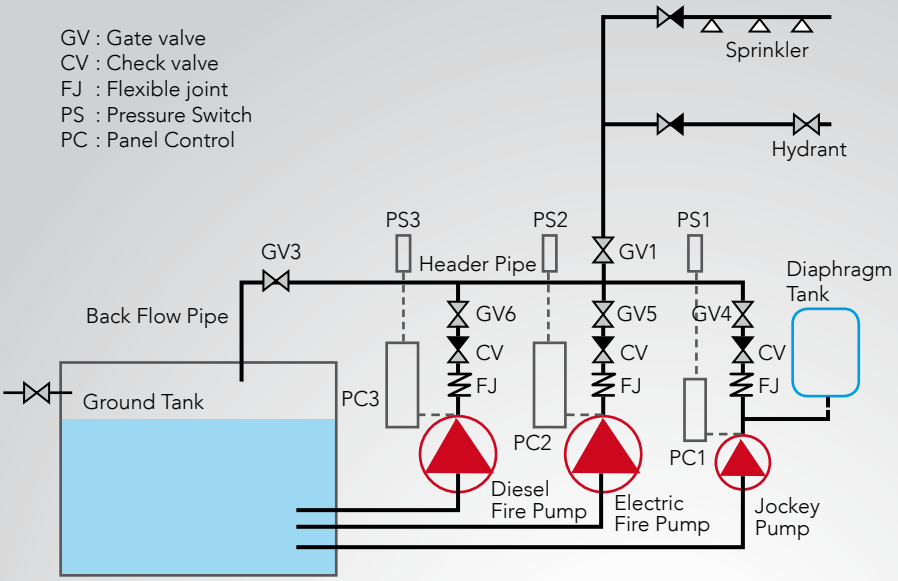
INSTALLATION OF
PIPE & ACCESSORIES



Dwg-6a : Installation of suction pipe & accessories comply to general standard (Negative suction)

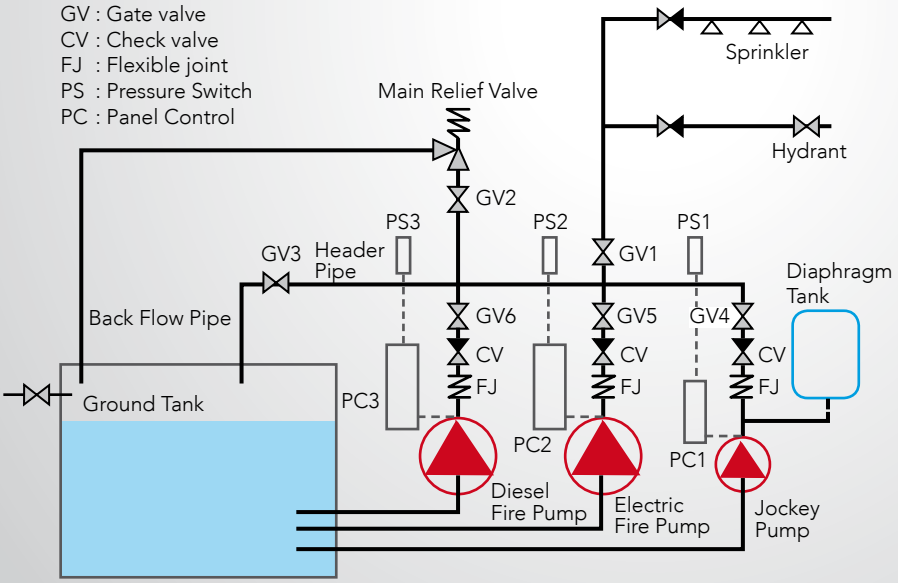


Dwg-6b : Installation of suction pipe & accessories comply to NFPA 20Std (Positive suction/water level position should be above the inlet, V = 150% above 0 mtr)



Dwg-7a : Installation of pipe & accessories comply to general standard with back flow pipe

The common standard installation of pipes and accessories is as in Dwg.7a. From the header pipe fitted a back flow pipe which functioned at the time of testing for all three pumps.



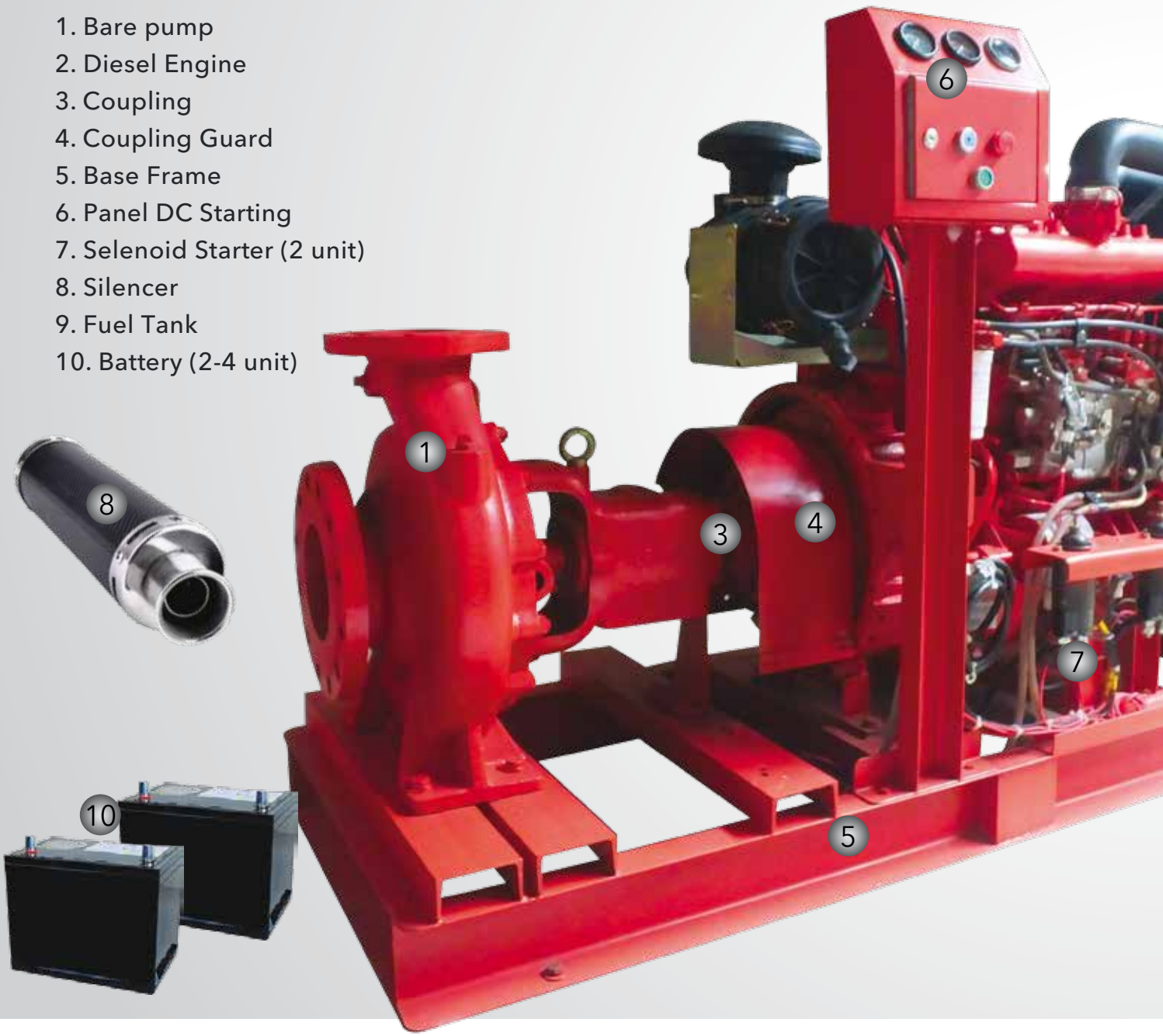
Dwg-7b: Installation of pipe & accessories comply to NFPA 20Std, with back flow pipe and main relief valve

The installation of pipes and accessories referring 20Std NFPA standard is as in Dwg.7b. From the header pipe fitted two back flow pipe, back pipe flow-1 is used at the time of testing in general for all three pumps, while the back-flow pipe 2 attached to main relief valve will be used for automatic test of the diesel engine (Weekly / monthly test).

MAIN COMPONENT OF
FIRE FIGHTING PUMP

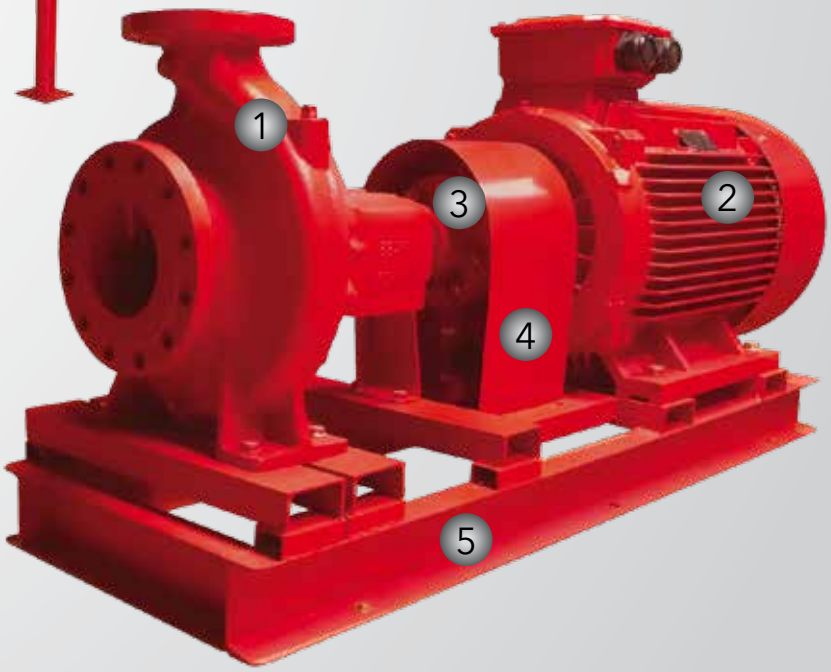
DIESEL ENGINE

1. Bare pump
2. Diesel Engine
3. Coupling
4. Coupling Guard
5. Base Frame
6. Panel DC Starting
7. Selenoid Starter (2 unit)
8. Silencer
9. Fuel Tank
10. Battery (2-4 unit)



CONTROL PANEL

1. Indicator Lamp Power On
2. Indicator Lamp phase Reversal
3. Push Button Power Off (Red)
4. Push Button Power On (Green)
5. Emergency Handle
6. Selector Breaker MCCB On-Off
7. Ampere Meter



PUMP

1. Bare pump
2. Electric Motor
3. Coupling
4. Coupling Guard
5. Baseframe

MAIN COMPONENT OF
JOCKEY PUMP

PUMP

1. Bare Pump
2. Electric Motor
3. Coupling & Coupling Guard

CONTROL PANEL

1. Indicator Lamp Pump On
2. Indicator Lamp Power On
3. Indicator Lamp Pump Trip
4. Push Button Pump On (Green)
5. Selector Switch Auto - Manual
6. Push Button Pump Off (Red)
7. Selector Breaker On - Off

Your Ultimate Fire Protection for Your Valuable Assets

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We understand the importance of reliable equipment in industry and building services market

McKarlen Limited (UK).
Obart House Liphook Way
20/20 Industrial Estate,
Maidstone,
Kent, ME 16 OFZ

Phone: 0800 0924423
Email: info@mckarlen.com

McKarlen Taiwan, Inc.
No. 16, Lien-Ming Street,
Bade District,
Taoyuan City,
Taiwan 334

Phone: (+886) 3 371 3969
E-mail: info@mckarlen.com

McKarlen Indonesia
DUTA INDAH ICONIC
Blok B/3, Jl. MH Thamrin,
Kebon Nanas, Tangerang
Banten – Indonesia

Phone: 021-22599680/81/82
E-mail: info@mckarlen.co.id

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