

Instructions on Installation, Operation and Maintenance Manual for Kirloskar Non-Clog Submersible series (IE2)



Enriching Lives



WARRANTY

We warrant that the pump supplied by us is free from defective material and faulty workmanship. This warranty holds good for a period of 12 months from the date of commissioning the equipment or 18 months from the date of dispatch from our factory, whichever is earlier. Our liability in respect of any complaint is limited to replacing part/parts free of charge ex-works or repairs of the defective part/parts only to the extent that such replacement/repairs are attributable to or arise solely from faulty workmanship or defective material.

This warranty holds good only for the products manufactured by us.

– KIRLOSKAR BROTHERS LIMITED –



CAUTION

1. DO NOT LOWER OR LIFT THE PUMP WITH THE HELP OF CABLES.
2. DO NOT FILL ANY LIQUID INSIDE THE MOTOR.
3. DO NOT MEGGER CONTROL PANEL CONTROL CIRCUIT TERMINALS.
4. DO NOT RUN THE PUMP DRY OR IN REVERSE DIRECTION.
5. DO NOT RUN THE PUMP WITHOUT CONTROL PANEL.
6. DO NOT RUN THE PUMP WITH CONTROL UNIT IN BYPASSED CONDITION.
7. DO NOT MEGGER CONTROL CABLE OF THE PUMP WITHOUT DISCONNECTING FROM THE CONTROL PANEL.

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NOTE:

- Please ensure these instructions are read fully before installation and operation of the pump.
- Please furnish complete nameplate details, name of parts, part nos. and material of construction while ordering spare parts for the pump

1. GENERAL :

1.1 KIRLOSKAR submersible sewage pumps type “NS” is available in the following types.

1. iNS series (1HS Series Code)

Unit	kW Ratings in 2Pole	kW Ratings in 4Pole	kW Ratings in 6Pole
iNS unit - 1	0.75-1.1	0.55-0.75	-
iNS unit - 2	1.5-2.2	1.1-1.5	-
iNS unit - 3	3.7	2.2	-
iNS unit - 4	5.5-7.5	3.7-7.5	2.2-5.5
iNS unit - 5	9.3-18.5	9.3-15	-
iNS unit - 6	22	18.5-22	-

2. NS Series (192 Series Code)

Unit	kW Ratings in 4Pole	kW Ratings in 6Pole
NS unit - 1	-	7.5 -11
NS unit - 2	-	15
NS unit - 3	30	18.5-22
NS unit - 4	37-45	30
NS unit - 5	55	37
NS unit - 6	75	45
NS unit - 7	90	55
NS unit - 8	110-132	75-110
NS unit - 9	160-200	132-180
NS unit - 10	225	-

The following charts can be referred to know the pumps available in type of impellers ratings.

A. Refer below chart for 2 pole Models: (iNS)

Sr. No.	IMPELLER		kW RATING IN 2 POLE											
	PUMP	QT	0.75	1.1	1.5	2.2	3.7	5.5	7.5	9.3	11	15	18.5	22
1	20/13	*	*	*	*	*								
2	20/16	*				#	*	*	*					
3	20/20	*					*	*	*	*	*	*		
4	32/13	*			*	*	*							
5	32/16	*					*	*	*					
6	40/13	*				*	*	*						
7	40/16	*					*	*	*					
8	40/20	*								*	*	*		
9	50/13	*					*	*	*					
10	50/16	*							*	*	*	*	*	*
11	50/20	*								*	*	*	*	*
12	65/13	*						*	*	*	*	*		
13	65/16	*								*	*	*	*	*

*-design

developed. #-yet to develop.

How to read – NS20/13QT 1.1/2 i (i-stands for iNS)

B. Refer below chart for 4 pole Models: (iNS)

Sr. No.	IMPELLER TYPE									kW Rating in 4 pole								
	PUMP	N	QM	Q	QT	NB	QMB	NM	QMM	2.2	3.7	5.5	7.5	9.3	11	15	18.5	22
1	40/20				*					*	*							
2	40/32				*					*	*	*						
3	50/20				*					*	*	*						
4	50/26	*	*	*	*	*	*				*	*	*	*	*			
5	50/32	*	*		*								*	*	*	*	*	*
6	50/36		*												*	*	*	*
7	65/32	*	*	*	*	*	*						*	*	*	*	*	*
8	80/26	*	*	*	*								*	*	*	*	*	*
9	100/26	*	*	*	*								*	*	*	*	*	*
10	100/32	*	*	*	*										*	*	*	*
11	150/26	*	*	*	*	*	*	*	*						*	*	*	*
12	150/32	*	*	*	*												*	*
13	80/40	*	*	*	*			*	*								*	*

C. Refer below chart for 6 pole Models: (iNS)

Sr. No.	IMPELLER TYPE									kW Rating in 6 pole		
	PUMP	N	QM	Q	QT	NB	QMB	NM	QMM	2.2	3.7	5.5
1	40/32				*					*		
2	50/26	*	*	*	*	*	*			*	*	*
3	50/32	*	*		*					*	*	*
4	50/36		*								*	*
5	65/32	*	*	*	*	*	*			*	*	*
6	80/26	*	*	*	*						*	*
7	100/26	*	*	*	*						*	*
8	150/26	*	*	*	*	*	*	*	*		*	*

D. Refer below chart for 4 pole Models: (NS).

Sr. No.	IMPELLER TYPE										kW RATING IN 4 POLE											
	PUMP	N	QM	Q	QT	NB	QMB	NM	QMM	X	30	37	45	55	75	90	110	132	160	180	200	225
1	150/26	*	*	*	*	*	*	*	*		*	*										
2	100/32	*	*	*	*						*	*	*									
3	150/32	*	*	*	*						*	*	*	*								
4	200/32	*	*	*	*						*	*	*	*	*							
5	80/40	*	*	*	*			*	*		*	*	*	*								
6	100/40	*	*	*	*						*	*	*	*	*							
7	150/40	*	*	*	*								*	*	*	*	*	*				
8	200/40	*	*	*	*									*	*	*	*	*	*			
9	250/40	*												*	*	*	*	*	*	*		
10	150/50	*		*											*	*	*	*	*	*	*	*
11	250/34									*		*	*	*	*	*						

How to read – NS150/26Q 30/4

E. Refer below chart for 6 pole Models: (NS)

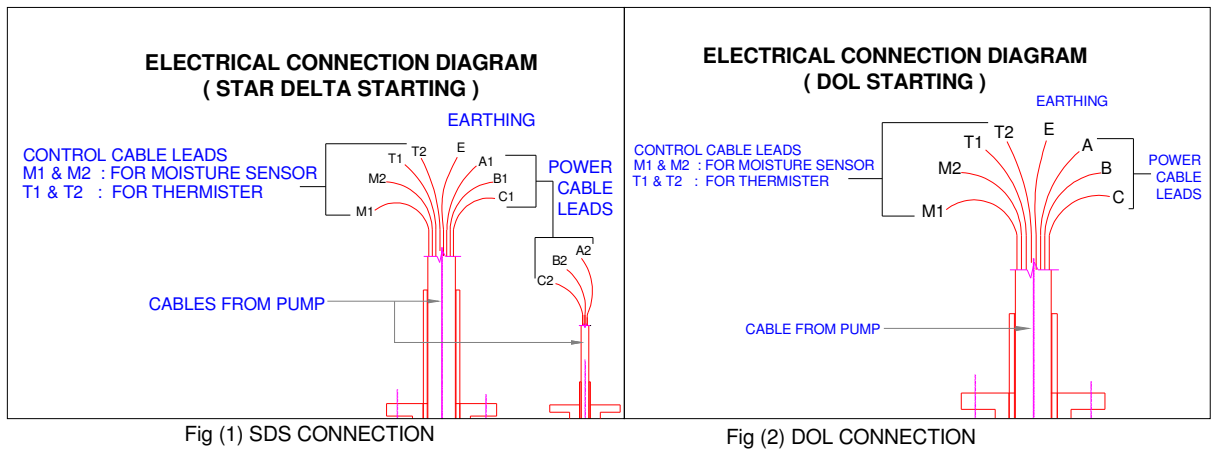
IMPELLER TYPE										kW RATING IN 6 POLE															
PUMP	N	QM	Q	QT	NB	QMB	NM	QMM	X	7.5	9.3	11	15	18.5	22	30	37	45	55	75	90	110	132	160	180
50/32	*	*		*						*															
50/36		*								*															
65/32	*	*	*	*	*	*				*															
80/40	*	*	*	*	*		*	*		*	*	*	*												
100/26	*	*	*	*						*															
100/32	*	*	*	*						*	*	*	*	*											
100/40	*	*	*	*							*	*	*	*	*	*									
150/26	*	*	*	*	*	*	*	*		*	*														
150/32	*	*	*	*						*	*	*	*												
150/40	*	*	*	*	*							*	*	*	*	*	*	*							
150/50	*	*	*	*	*											*	*	*	*	*	*				
200/32	*	*	*	*	*							*	*	*	*										
200/40	*	*	*	*	*									*	*	*	*	*	*						
250/34									*				*	*	*	*									
250/40	*																*	*	*						
250/50	*	*																	*	*	*	*	*	*	*
300/55				*																	*	*	*	*	*
350/40									*							*	*	*	*	*			*	*	*
350/47									*												*	*	*	*	*

1.2 The pump comprises of three units:

- I. **Pump unit** – It comprises of a delivery casing having wide volute opening and non-clog type of impeller. The casing is attached with connector unit or stand as per order.
- II. **Stuffing box unit** – It comprises double mechanical seal and mechanical seal housing filled with oil for lubricating the seals. The seal behind the impeller is having seat ring of silicon carbide V/s silicon carbide and second seal comprises of carbon ring V/s stainless steel ring.
- III. **Electrical motor unit** – These pumps are provided with submersible three phase squirrel cage induction motors in watertight housing. The entire motor unit is air tested to ensure the leak tightness of the joints. Moisture sensor is provided in the mechanical seal housing to give the indication to control panel which in turn trips the motor, when the seal near impeller fails. The pump is provided with high and low liquid level controllers which avoids dry running of pump.

- 1.3 The NS pump can be supplied in portable or with fixed arrangement. When the pump is supplied with portable type, hose, connection should be provided to avoid weight of pipe line on the pump casing. The casing is provided with stand for support. For stationary application, the pump is mounted on the support bracket and is connected to the delivery bend through a rubber diaphragm and connector unit. The pump slides over the guide pipes without disconnecting/disturbing the delivery pipe line.

- 1.4 NS pump is supplied with wall mounted control panel. These control panels are supplied either with **DIRECT ON LINE, STAR DELTA, SOFT STARTER or ATS** type starters. These panels are designed for smooth running of pump-set. The pump gets switched off automatically and is protected against the following.
- a. Contamination of oil with pumped liquid.
 - b. Dry running of pump.
 - c. Single phasing/reverse phasing.
 - d. Over load.
 - e. Overheating of winding [against order].
- The coding of leads of the cables is clearly marked on each lead and the connections to the control panel should be made as per connections diagram of control panel and as per below shown Figure (1) & (2).



- 1.5 As a standard scope of supply, NS pumps are supplied with 5 or 10 m long cable. This cable consists of **power cable** having 4 and 3 core for Star Delta starting (for rating from 11kW to 22kW) and 4 core cables for DOL (for rating upto 9.3kW) starting suitably designed for the voltage and current. The **control cable** of 4 cores 1.5 sq.mm is used for thermistor and moisture sensor 2 wires each.

2. Safety Instructions:



2.1: General Information

Before performing any actions detailed within this instruction, the Site Health and Safety instructions shall be read and fully understood. The instructions in this document shall also be read and fully understood.

Whenever the equipment is operated, maintained or used in any way, the procedures detailed within the Health and Safety Dossier (DHS) and any procedures detailed within these instructions shall be followed. The pump supplied by Kirloskar Brothers Limited (KBL) has been designed with safety in mind; where hazards cannot be eliminated, the risk has been minimized using guards and other design features. Some hazards cannot be guarded against and the instructions below **MUST BE COMPLIED WITH** for safe operation. These instructions cannot cover all circumstances. It is the responsibility of the user of the equipment for maintaining safe working practices always. The pumps are supplied with stickers for hazard, caution and safety wherever these are applicable.

2.1.1 Within the manual, safety instructions are marked with safety symbols.

Hazard.



- d.
- a. This symbol refers to general mechanical aspects of safety.



- c. This symbol refers to electrical safety.

- b. This symbol is used to introduce safety instructions whose non- Observance may lead to damage to the machine and its functions.



- e. This symbol refers to magnetic field safety.





- f. This symbol refers to restrict person having heart pacemaker to avoid contact with magnetic components while pump is in running condition or while carrying out maintenance work of pump.

- 2.1.2 KBL products are designed for installation in designated areas, which are to be kept clean and free of obstructions that may restrict safe access to the controls and maintenance access points. Pump nameplate is fitted to each unit and must not be removed. Loss of this plate could make identification impossible. This in turn could affect safety and cause difficulty in obtaining spare parts. Should accidental loss or damage occur, contact KBL immediately.
- 2.1.3 Access to the equipment should be restricted to the personnel responsible for installation, operation and maintenance and they must be trained, adequately qualified and supplied with the appropriate tools for their respective tasks.
- 2.1.4 KBL firmly insists that all personnel responsible for installation, operation and maintenance of the equipment must read the manual before any work is done.
- 2.1.5 Ear defenders should be worn where the specified equipment noise level exceeds locally defined safe levels. Safety glasses or goggles should be worn where working with pressurized systems and hazardous substances. Other personal protection equipment must be worn where local rules apply.

Caution

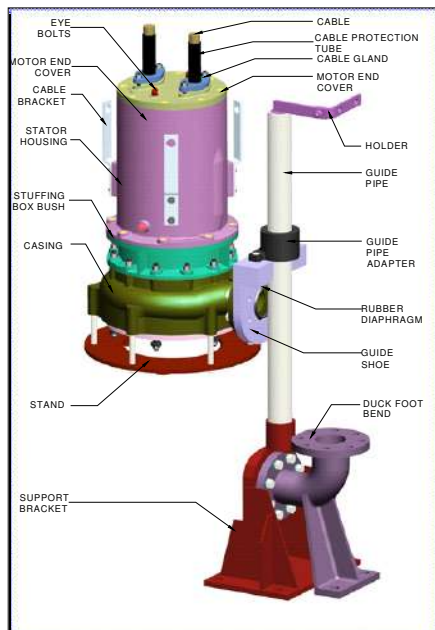
- 2.2 *DO NOT* wear loose or frayed clothing or jewellery, which could catch on the controls or becomes trapped in the equipment.
- 2.3 Operation of the equipment for the application other than for which it is supplied can increase the risk from hazards. Please consult KBL before making such change in the application of the equipment.
- 2.4 Improper installation, operation and maintenance of the product supplied by KBL could result in injury or death.

Caution

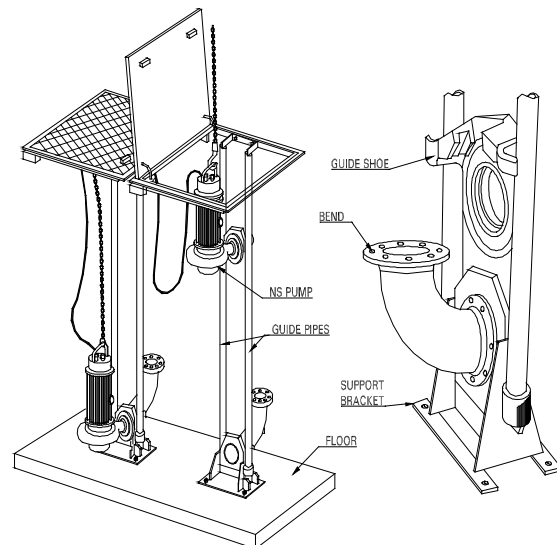
- 2.6 In case of NS pumps which are handling fluid at high temperature, the operator should avoid touching the pump in running condition. Use safety equipments like hand gloves and safety shoes while operating NS pumps in such applications.

3. INSTALLATION:

- 3.1 The NS pumps of **stationary arrangement** are supplied with pump connector unit and this connector unit is connected to pump support bracket with guide shoe & rubber diaphragm to make it leak proof joint.



Single guide pipe arrangement (iNS)



Double guide pipe arrangement

Stationary Installation view.

3.1.1 Installation of support bracket & bend –

Before installing the pump, ensure that sump bottom is flat and leveled. The support bracket & bend should be attached and fixed to the sump bottom with foundation bolts, so that the guide pipe shall be exactly vertical.

Ensure that support bracket and bend are located correctly relative to descending pump vertical guide pipe and discharge pipe.

3.1.2 Lowering the pump - Attach the guide shoe & guide pipe adapter to the pump. The unsupported length of guide pipe should not exceed 6 m.

3.1.3 Fix the guide pipe in the support bracket and locate the vertical position of guide pipe holder at the top of the pit. Now grout the guide pipe holder.

3.1.4 Insert the above assembly in the guide pipe by dismantling the guide pipe holder & refit the holder in the guide pipe.

3.1.5 Check- Lower the pump with the help of chain. While sliding over the guide pipe into the sump, check that the cable is not slugging and is not under tension.

3.1.6 Ensure that the pump position is exactly vertical on the support bracket. Check by giving a jerk.

3.1.7 Before taking the pumping station into use, check that there are no loose solid pieces or other material on bottom of sump that would damage the pump.

3.1.8 DO NOT LIFT THE PUMP WITH THE HELP OF CABLES.



3.2 The NS pumps supplied for **portable installation** requires no foundation. Only ensure that the delivery pipe line is well supported and its weight is not acting on pump casing directly.

3.3 Use chain with intermediate hooks for holding to lower or lift the pump. This type of chain is specially designed to avoid the tendency of the operator to lift the pump with the help of cable causing damage & replacement of the cable unit. While selecting size of the chain, refer weight of the pump given in 7.6. and chain capacity as per chart in 3.4. We recommend use of non-return valve in delivery pipe line located before sluice valve.

- 3.4 As per IS: 2429 the following sizes of chains can be used upto the weight as mentioned in the below chart.

Nom. Chain Size (mm)	Lifting capacity (Tonnes)
6	0.44
8	0.8
10	1.25
12	1.8
14	2.4
16	3.2

4. OPERATION:

- 4.1 Prior to commissioning of the pump, check the following.

FILL THE OIL INSIDE THE MECHANICAL SEAL HOUSING WITH PROPER GRADE REFER CHART IN 7.5 OF CLEAN OIL FREE FROM MOISTURE. ENSURE THE MECHANICAL SEAL HOUSING OF THE PUMP IS DULY FILLED AS PER CHART IN 7.6. CHECK THE OIL PLUG OF THE MECHANICAL SEAL HOUSING IS INTACT.



- 4.1.1 Check the insulation resistance of winding by using 500 V megger. The insulation resistance of winding should not be less than 10 mega-ohms for motor rating upto 45kW and 50 mega-ohms beyond 45kW at phase to phase and phase to Earth. This test should be carried out at free end of the cable. If the insulation resistance is found less than mentioned above then please consult our service personnel.

For continuity test, connect the two wires of megger between the two ends of the same phase of motor. It should show zero resistance. This test should be carried out for the phases.

The resistance across two moisture sensing wires M1 and M2 should be above 5 MΩ. Make sure to remove control cable connections from terminal board [M1 and M2] before testing this. If the resistance found less, please consult our service department. The megger test for phase to phase and phase to Earth should be conducted serially. The megger test should show insulation resistance above 10 MΩ for motor rating upto 45kW and 50 MΩ beyond 45kW.

- 4.1.2 The control panel is provided with auto/manual switch. When the switch is on "Manual" position the pumpset can be started manually by the start push button provided the liquid level is above the low level electrode. If the switch is on "Auto" position it will start automatically if liquid level in the sump, is above the high-level electrode. The pump set gets switched off automatically for any position of Auto Manual switch if liquid level goes down just below the low-level electrode. This is indicated by glowing of red lamp on control panel.

When the pumped liquid gets mixed up with the oil in the casing cover, it is indicated by glowing of red lamp under name plate contamination. After rectification of the fault, resetting switch is to be pressed first and then the pump set will get started by pressing "Starting switch" if it is operated on "Manual position" or automatically if control panel is operating on "Auto position".

Before change over from star to delta connection, time delay should be sufficient to allow the motor to attain its normal running speed. The same depends upon the load of the motor and it is generally around 10 second.

- 4.1.3 LIQUID LEVEL CONTROLLERS ARE INCORPORATED IN THE PANEL TO PROTECT THE PUMP FROM DRY RUNNING. THE LOW-LEVEL ELECTRODE SHOULD BE POSITIONED IN SUCH A MANNER THAT LOWEST END OF ELECTRODE REMAINS ABOVE MOTOR BODY. IF LOW LEVEL ELECTRODE IS NOT INSTALLED PROPERLY THE MOTOR BODY IS LIKELY TO BE HEATED UP AS COOLING OF MOTOR IS DONE BY LIQUID IN THE SUMP AROUND THE STATOR HOUSING. HENCE SUBMERGENCE UPTO FULL CORE LENGTH OF MOTOR IS REQUIRED.

- 4.1.4 **Before starting the pump, check the direction of rotation is as outlined below.**

4.1.5 Hoist up the pump and momentarily switch on the power. If the connections are correctly made the pump should jerk in anticlockwise direction when viewed from top. If the pump jerks in opposite direction, change two phases of the incoming leads to the control panel. In no case the direction of rotation should be changed by changing the leads of motor terminals. Do not run the pump dry. Just check in which direction the pump jerks.

4.2 While putting the pump in operation, follow the procedure outlined below.

4.2.1 Start the pump. Let the motor pick-up its full speed.

4.2.2 Open the discharge valve slowly.

4.3 Check during running that –

4.3.1 The pump is running smooth.

4.3.2 Power consumption is within limit.

4.3.3 Head and capacity developed by the pump is as specified.

4.3.4 Stop the pump immediately if any defects are detected and must not be started unless they are rectified. Report immediately to the supplier if it is not possible to rectify the defect.

4.4 STOPPING THE PUMP:

4.4.1 Pump should be switched off only after closing the delivery sluice valve.

5. MAINTENANCE:

Preventive maintenance schedule is the periodical checks and precautions by which possibilities of failure and break-downs are minimized.

5.1 Daily checks –

5.1.1 An hourly record of the delivery pressure and power input to the pump should be maintained.

5.1.2 Noise and vibrations is the first sign of impending troubles like bearing failure, choking of impeller or casing and such other operating troubles. The pump performance should be checked for noise and vibration.

5.2 Periodical checks –

5.2.1 The lubrication of mechanical seals should be checked. The lubricant might get contaminated with foreign material or get blackened due to overheating. In such cases, oil chamber should be flushed and filled with fresh oil. Before filling, heat the oil [Servo system 317] to 140°C. This is required to remove moisture present in the oil.

5.2.2 THE ELECTRODES/FLOAT SWITCHES SHOULD BE CLEANED WHENEVER POSSIBLE BUT NOT LATER THAN 15 DAYS FOR SMOOTH WORKING OF PUMP.

5.2.3 Clean the sump if there are chances of deposition of the contents of liquid handled.

5.2.4 Replace the Oil from pump periodically after 2000 hrs.

5.3 Annual checks [after one year minimum] –

5.3.1 The pump portion of the motor pump set should be overhauled completely to check the clearance and to replace the worn-out parts. Clearance between impeller and casing ring and casing cover are very important.

5.3.2 The effect of liquid handled on pump components should be checked. If abnormal corrosion, erosion is observed then the components should be replaced with that of suitable material.

6 SHUT DOWN / STORAGE / PRESERVATION

If operation is not required for some time after delivery, we recommend the following steps for storage of the pump:

6.1 Storage of new pumps up to 3 months (Short storage)

- i) Spray oil inside the pump housing, paying special attention to the area around the impeller wear ring. Spray oil through inlet and outlet flanges of pump. It is then recommended to cover the flanges with plastic caps or similar.
- ii) Store the pump in an upright position in a dry place. Support all electrical cables at cable entry points to avoid permanent distortion.
- iii) Electric connecting cables are capped securely for protection purposes prior to delivery. This protection must not be removed.
- iv) Use weather-proof coverings such as flame-resistant sheeting or tarpaulins.
- v) Tie coverings down to protect the pump from wind damage.
- vi) Place the unit on skids, pallets or shoring higher than 5 inches from the ground for good air circulation.
- vii) Maintain an even temperature of 15 degree Celsius or higher above the dew point.

6.2 Pump long term storage requirements (Above 3 months)

Submersible units require proper preparation for storage and regular maintenance during storage. The unit is considered in storage when it has been delivered to the job site and is awaiting installation.

6.2.1 Storage preparation

- i) Although this is a submersible pump, storage in a clean, dry area will help preserve the paint and prevent corrosion. Hand rotation of the shaft every fifteen days is recommended to keep the seals free and the bearings lubricated.
- ii) Spray oil inside the pump housing, paying special attention to the area around the impeller wear ring. Spray oil through inlet and outlet flanges of pump. It is then recommended to cover the flanges with plastic caps or similar.
- iii) Take care of all indoor storage requirements.
- iv) Use weather-proof coverings such as flame-resistant sheeting or tarpaulins.
- v) Tie coverings down to protect the pump from wind damage.
- vi) Place the unit on skids, pallets or shoring higher than 5 inches from the ground for good air circulation.
- vii) Maintain an even temperature of 15 degree Celsius or higher above the dew point.

6.3 Site condition before installation of pump:

Pit in which pump is to be installed should be clean, free from hard particles such as nails, cement/sand particles etc. Submersible pumps are designed only to handle the soft particles such as clothes, plastic bags, etc.

6.4 Measures for prolonged shut down periods

- i) The pump remains installed ready for operation when required.
- ii) To maintain pump availability, the pump should be started for 10 second, once in every week.
- iii) Always keep cable ends out of the sump to avoid leakage through cable ends to pump.

6.5 The pump is dismantled and stored

- i) Prior to storage the pump should be checked and maintained in accordance operator must ensure that all maintenance, inspection and repair work is carried out by qualified, authorized staff who are familiar with the equipment and who have read the operating instructions.
- ii) O-ring need to change after dismantling the pump. Do not use old O-rings for reassembly of the pumps.

6.6 Rubber components storage ideal conditions

If the pumps are stored in below conditions, rubber components shelf life should be of 5 years otherwise all rubber components need to be replaced after 1 year.

Condition:

- a. store in cool, dry place with temperature below 15 degree Celsius.

- b. keep away from direct heat or open flame.
- c. store without stretch or tension including hanging.
- d. keep product wrapped or sealed to minimize the absorption of moisture.
- e. store in relaxed condition free from tension, compression or other deformation.

6. TECHNICAL DATA

7.1 Non-Clog Submersible pumps are supplied at maximum speed 1450 rpm having 4 pole motors. However, the same pump can be offered at 980 rpm having 6 pole motor if fits in duty points. The direction of rotation is clockwise when viewed from the motor top. We have newly introduced pump series in iNS at 2950rpm having 2Pole.

7.2 SPECIFICATIONS OF BEARINGS:

The shaft is supplied with antifriction ball bearings at both ends. The bearing specifications are given below. The designations of bearings are as per SKF catalogue. However, equivalent bearing in type, capacity and dimensions are also can be used.

LUBRICATION:

Bearings of NS pumps are grease sealed for life. Re-lubrication of these bearings is not required.

Sr. No.	Motor rating in kW	Lower bearing	Qty.	Upper bearing	Qty.
1	i-NS unit - 1	6305-2RS1	1	6303 2RSH	1
2	i-NS unit - 2	6305-2RS1	1	6303 2RSH	1
3	i-NS unit - 3	6307 2RS1	1	6305 2RS1	1
4	i-NS unit - 4	6307 2RS1	1	6305 2RS1	1
5	i-NS unit - 5	6307 2RS1	1	6306 2RS1	1
6	i-NS unit - 6	6307-2RS1	1	6306 2RS1	1
7	NS unit - 1	6309-2RS1	1	6306-2RS1	1
8	NS unit - 2	6309-2RS1	1	6306-2RS1	1
9	NS unit - 3	7312 BG Back to Back	2	6309-2RS1	1
10	NS unit - 4	7312 BG Back to Back	2	6309-2RS1	1
11	NS unit - 5	7315 BG Back to Back	2	6311-2RS1	1
12	NS unit - 6	7318 BG Back to Back	2	6313-2RS1	1
13	NS unit - 7	7318 BG Back to Back	2	6313-2RS1	1
14	NS unit - 8	7318 BG Back to Back	2	6313-2RS1	1
15	NS unit - 9	7320 BG Back to Back	2	6318-2RS1	1

7.3 EBXL CABLE CURRENT CARRYING CAPACITY

Cable size (sq.mm)	Approx. Current carrying capacity (amp)	Cable size (sq.mm)	Approx. Current carrying capacity (amp)
8C X 1.5	20	4C X 4 + 4C X 1.5	53/22
8C X 2.5	39	4C X 10 + 4C X 1.5	96/22
4C X 25	174	4C X 16 + 4C X 1.5	133/22
4C X 35	191	4C X 25 + 4C X 1.5	174/22
4C X 50	239	4C X 35 + 4C X 1.5	191/22
3C X 4	53	4C X 50 + 4C X 1.5	239/22
3C X 10	96	4C X 70 + 4C X 1.5	295/22
3C X 16	133	4C X 120 + 4C X 1.5	414/22
3C X 25	174	4C X 95 + 4C X 1.5	355/22
3C X 35	191		
3C X 50	239		
3C X 70	295/22		
3C X 95	355/22		
3C X 120	414/22		

Note: These values are for reference only.
Consider factor of safety as 0.87 if ambient temperature is 45 degree Celcius.

7.4 MECHANICAL SEALS:

Sr. No.	Motor ratings in kW	Seal size in mm	Mechanical seal type	
			Inboard	Outboard
1	iNS all 2 Pole ratings	22	SiC Vs SiC	Carbon Vs St. Steel
2	iNS 4 Pole ratings upto 7.5kW	22		
3	iNS 4 Pole ratings above 7.5kW	40		
4	UNIT-I & II	40	SiC Vs SiC	Carbon Vs St. Steel
5	UNIT-III	55		
6	UNIT – IV	65		
7	UNIT – V & VI	80		
8	UNIT – VII, VIII & IX	90		

7.5 LUBRICATION FOR MECHANICAL SEALS:

The upper mechanical seal faces are lubricated by oil provided in casing cover. The lubricating oil should conform to the following grades of oil available in the market.

Note: The oil used should be highly refined straight mineral product of high demulsibility free from running and acid forming tendencies. Detergent Oil may cause foaming and should not be used.

NAME	OIL SPECIFICATION	NAME	OIL SPECIFICATION
ELF	ACANTIS HM 68	VEEDOL	ATLINE 68
IOC	SERVOSYSTEM 57/68/317	PENNZOIL	PENNZBELL AW 68
HPCL	ENKLO 57	BPCL	HYDRO 68
CASTROL	HYPIN EP 68	ESSO	AW68
GULF	HARMONY 68	MOBIL	AW68
SHELL	TELLUS 68		

7.6 WEIGHTS OF PUMPS AND OIL QUANTITY:

Model	kW	Pole	Oil Qty (approx)	Pump & connector Wt. (kg) (approx)	Model	kW	Pole	Oil Qty (approx)	Pump & connector Wt (kg) (approx)
NS100/26N	7.5	4	3 Litre	240 120	NS150/26NM	15	4	3 Litre	340 155
NS100/26N	9.3	4	3 Litre	265 120	NS150/26NM	18.5	4	3 Litre	345 155
NS100/26N	11	4	3 Litre	268 120	NS150/26NM	22	4	3 Litre	355 155
NS100/26N	15	4	3 Litre	315 120	NS150/26Q	11	4	3 Litre	335 155
NS100/26N	18.5	4	3 Litre	320 120	NS150/26Q	15	4	3 Litre	340 155
NS100/26N	22	4	3 Litre	330 120	NS150/26Q	18.5	4	3 Litre	345 155
NS100/26Q	7.5	4	3 Litre	240 120	NS150/26Q	22	4	3 Litre	355 155
NS100/26Q	9.3	4	3 Litre	307 120	NS150/26QMB	11	4	3 Litre	335 155
NS100/26Q	11	4	3 Litre	310 120	NS150/26QMB	15	4	3 Litre	340 155
NS100/26Q	15	4	3 Litre	315 120	NS150/26QMB	18.5	4	3 Litre	345 155
NS100/26Q	18.5	4	3 Litre	320 120	NS150/26QMB	22	4	3 Litre	355 155
NS100/26Q	22	4	3 Litre	330 120	NS150/26QM	11	4	3 Litre	335 155
NS100/26QM	7.5	4	3 Litre	240 120	NS150/26QM	15	4	3 Litre	340 155
NS100/26QM	9.3	4	3 Litre	265 120	NS150/26QM	18.5	4	3 Litre	345 155
NS100/26QM	11	4	3 Litre	268 120	NS150/26QM	22	4	3 Litre	355 155
NS100/26QM	15	4	3 Litre	315 120	NS150/26QNM	11	4	3 Litre	335 155
NS100/26QM	18.5	4	3 Litre	320 120	NS150/26QNM	15	4	3 Litre	340 155
NS100/26QM	22	4	3 Litre	330 120	NS150/26QNM	18.5	4	3 Litre	345 155
NS100/26QT	7.5	4	3 Litre	240 120	NS150/26QNM	22	4	3 Litre	355 155
NS100/26QT	9.3	4	3 Litre	307 120	NS150/26QT	11	4	3 Litre	335 155
NS100/26QT	11	4	3 Litre	310 120	NS150/26QT	15	4	3 Litre	340 155
NS100/26QT	15	4	3 Litre	315 120	NS150/26QT	18.5	4	3 Litre	345 155
NS100/26QT	18.5	4	3 Litre	320 120	NS150/26QT	22	4	3 Litre	355 155
NS100/26QT	22	4	3 Litre	330 120	NS150/32N	18.5	4	4 Litre	350 155

Model	kW	Pole	Oil Qty (approx)	Pump & connector Wt. (kg) (approx)		Model	kW	Pole	Oil Qty (approx)	Pump & connector Wt (kg) (approx)	
NS100/32N	11	4	4 Litre	330	120	NS150/32N	22	4	4 Litre	360	155
NS100/32N	15	4	4 Litre	335	120	NS150/32Q	18.5	4	4 Litre	350	155
NS100/32N	18.5	4	4 Litre	340	120	NS150/32Q	22	4	4 Litre	360	155
NS100/32N	22	4	4 Litre	350	120	NS150/32QM	18.5	4	4 Litre	350	155
NS100/32Q	11	4	4 Litre	330	120	NS150/32QM	22	4	4 Litre	360	155
NS100/32Q	15	4	4 Litre	335	120	NS150/32QT	18.5	4	4 Litre	350	155
NS100/32Q	18.5	4	4 Litre	340	120	NS150/32QT	22	4	4 Litre	360	155
NS100/32Q	22	4	4 Litre	350	120	NS40/20QT	2.2	4	1.7 Litre	145	55
NS100/32QM	11	4	4 Litre	330	120	NS40/20QT	3.7	4	1.7 Litre	155	55
NS100/32QM	15	4	4 Litre	335	120	NS40/20QT	1.5	4	1.7 Litre	143	55
NS100/32QM	18.5	4	4 Litre	340	120	NS40/32QT	2.2	4	4 Litre	147	55
NS100/32QM	22	4	4 Litre	350	120	NS40/32QT	3.7	4	4 Litre	150	55
NS100/32QT	11	4	4 Litre	330	120	NS40/32QT	5.5	4	4 Litre	165	55
NS100/32QT	15	4	4 Litre	335	120	NS40/32QT	7.5	4	4 Litre	165	55
NS100/32QT	18.5	4	4 Litre	340	120	NS40/32QT	2.2	4	1.7 Litre	150	65
NS100/32QT	22	4	4 Litre	350	120	NS50/20QT	3.7	4	1.7 Litre	170	65
NS150/26NB	11	4	3 Litre	335	155	NS50/20QT	5.5	4	1.7 Litre	165	65
NS150/26NB	15	4	3 Litre	340	155	NS50/26NB	9.3	4	3 Litre	225	65
NS150/26NB	18.5	4	3 Litre	345	155	NS50/26NB	3.7	4	3 Litre	185	65
NS150/26NB	22	4	3 Litre	355	155	NS50/26NB	5.5	4	3 Litre	180	65
NS150/26N	11	4	3 Litre	335	120	NS50/26NB	7.5	4	3 Litre	180	65
NS150/26N	15	4	3 Litre	340	155	NS50/26N	9.3	4	3 Litre	225	65
NS150/26N	18.5	4	3 Litre	345	155	NS50/26N	3.7	4	3 Litre	180	65
NS150/26N	22	4	3 Litre	355	155	NS50/26N	5.5	4	3 Litre	180	65
NS150/26NM	11	4	3 Litre	335	155	NS50/26N	7.5	4	3 Litre	180	65
NS50/26Q	9.3	4	3 Litre	225	65	NS65/32Q	11	4	4 Litre	280	75
NS50/26Q	3.7	4	3 Litre	185	65	NS65/32Q	15	4	4 Litre	285	75
NS50/26Q	5.5	4	3 Litre	180	65	NS65/32Q	18.5	4	4 Litre	290	75
NS50/26Q	7.5	4	3 Litre	180	65	NS65/32Q	22	4	4 Litre	300	75
NS50/26QMB	9.3	4	3 Litre	225	65	NS65/32Q	7.5	4	4 Litre	230	75
NS50/26QMB	3.7	4	3 Litre	175	65	NS65/32QMB	9.3	4	4 Litre	275	75
NS50/26QMB	5.5	4	3 Litre	180	65	NS65/32QMB	11	4	4 Litre	280	75
NS50/26QMB	7.5	4	3 Litre	180	65	NS65/32QMB	15	4	4 Litre	285	75
NS50/26QM	9.3	4	3 Litre	225	65	NS65/32QMB	18.5	4	4 Litre	290	75
NS50/26QM	3.7	4	3 Litre	185	65	NS65/32QMB	22	4	4 Litre	300	75
NS50/26QM	5.5	4	3 Litre	180	65	NS65/32QMB	7.5	4	4 Litre	230	75
NS50/26QM	7.5	4	3 Litre	180	65	NS65/32QM	9.3	4	4 Litre	275	75
NS50/26QT	9.3	4	3 Litre	225	65	NS65/32QM	11	4	4 Litre	280	75
NS50/26QT	3.7	4	3 Litre	185	65	NS65/32QM	15	4	4 Litre	285	75
NS50/26QT	5.5	4	3 Litre	180	65	NS65/32QM	18.5	4	4 Litre	290	75
NS50/26QT	7.5	4	3 Litre	180	65	NS65/32QM	22	4	4 Litre	300	75
NS50/32N	9.3	4	4 Litre	275	65	NS65/32QM	7.5	4	4 Litre	230	75
NS50/32N	11	4	4 Litre	280	65	NS65/32QT	9.3	4	4 Litre	275	75
NS50/32N	15	4	4 Litre	285	65	NS65/32QT	11	4	4 Litre	280	75
NS50/32N	18.5	4	4 Litre	290	65	NS65/32QT	15	4	4 Litre	285	75
NS50/32N	22	4	4 Litre	300	65	NS65/32QT	18.5	4	4 Litre	290	75
NS50/32N	7.5	4	4 Litre	220	65	NS65/32QT	22	4	4 Litre	300	75
NS50/32QM	9.3	4	4 Litre	275	65	NS65/32QT	7.5	4	4 Litre	230	75
NS50/32QM	11	4	4 Litre	280	65	NS80/26N	9.3	4	3 Litre	250	85
NS50/32QM	15	4	4 Litre	285	65	NS80/26N	11	4	3 Litre	253	85
NS50/32QM	18.5	4	4 Litre	290	65	NS80/26N	15	4	3 Litre	290	85
NS50/32QM	22	4	4 Litre	300	65	NS80/26N	18.5	4	3 Litre	295	85
NS50/32QM	7.5	4	4 Litre	220	65	NS80/26N	22	4	3 Litre	305	85
NS50/32QT	9.3	4	4 Litre	275	65	NS80/26N	7.5	4	3 Litre	220	85
NS50/32QT	11	4	4 Litre	280	65	NS80/26N	5.5	4	3 Litre	220	85
NS50/32QT	15	4	4 Litre	285	65	NS80/26Q	9.3	4	3 Litre	250	85
NS50/32QT	18.5	4	4 Litre	290	65	NS80/26Q	11	4	3 Litre	253	85
NS50/32QT	22	4	4 Litre	300	65	NS80/26Q	15	4	3 Litre	290	85
NS50/32QT	7.5	4	4 Litre	220	65	NS80/26Q	18.5	4	3 Litre	295	85
NS50/36QM	11	4	4 Litre	270	65	NS80/26Q	22	4	3 Litre	305	85
NS50/36QM	15	4	4 Litre	275	65	NS80/26Q	7.5	4	3 Litre	220	85
NS50/36QM	18.5	4	4 Litre	280	65	NS80/26Q	5.5	4	3 Litre	220	85
NS50/36QM	22	4	4 Litre	290	65	NS80/26QM	9.3	4	3 Litre	250	85
NS65/32NB	9.3	4	4 Litre	275	75	NS80/26QM	11	4	3 Litre	253	85

Model	kW	Pole	Oil Qty (approx)	Pump & connector Wt. (kg) (approx)		Model	kW	Pole	Oil Qty (approx)	Pump & connector Wt (kg) (approx)	
NS65/32NB	11	4	4 Litre	280	75	NS80/26QM	15	4	3 Litre	290	85
NS65/32NB	15	4	4 Litre	285	75	NS80/26QM	18.5	4	3 Litre	295	85
NS65/32NB	18.5	4	4 Litre	290	75	NS80/26QM	22	4	3 Litre	305	85
NS65/32NB	22	4	4 Litre	300	75	NS80/26QM	7.5	4	3 Litre	220	85
NS65/32NB	7.5	4	4 Litre	230	75	NS80/26QM	5.5	4	3 Litre	220	85
NS65/32N	9.3	4	4 Litre	275	75	NS80/26QT	9.3	4	3 Litre	250	85
NS65/32N	11	4	4 Litre	280	75	NS80/26QT	11	4	3 Litre	253	85
NS65/32N	15	4	4 Litre	285	75	NS80/26QT	15	4	3 Litre	290	85
NS65/32N	18.5	4	4 Litre	290	75	NS80/26QT	18.5	4	3 Litre	295	85
NS65/32N	22	4	4 Litre	300	75	NS80/26QT	22	4	3 Litre	305	85
NS65/32N	7.5	4	4 Litre	230	75	NS80/26QT	7.5	4	3 Litre	220	85
NS65/32Q	9.3	4	4 Litre	275	75	NS80/40NM	18.5	4	8 Litre	287	85
NS50/26QM	3.7	6	3 Litre	180	65	NS80/40NM	22	4	8 Litre	297	85
NS50/26QM	5.5	6	3 Litre	180	65	NS80/40Q	22	4	8 Litre	287	85
NS50/26QM	2.2	6	3 Litre	185	65	NS80/40Q	18.5	4	8 Litre	297	85
NS50/26QT	2.2	6	3 Litre	185	65	NS80/40QM	18.5	4	8 Litre	287	85
NS50/26QT	3.7	6	3 Litre	180	65	NS80/40QM	22	4	8 Litre	297	85
NS50/26QT	5.5	6	3 Litre	180	65	NS80/40QNM	18.5	4	8 Litre	287	85
NS50/32N	2.2	6	4 Litre	225	65	NS80/40QNM	22	4	8 Litre	297	85
NS50/32N	3.7	6	4 Litre	220	65	NS80/40QT	18.5	4	8 Litre	287	85
NS50/32N	5.5	6	4 Litre	220	65	NS80/40QT	22	4	8 Litre	297	85
NS50/32QM	2.2	6	4 Litre	225	65	NS100/26N	3.7	6	3 Litre	240	120
NS50/32QM	3.7	6	4 Litre	220	65	NS100/26N	5.5	6	3 Litre	240	120
NS50/32QM	5.5	6	4 Litre	220	65	NS100/26Q	3.7	6	3 Litre	240	120
NS50/32QT	2.2	6	4 Litre	225	65	NS100/26Q	5.5	6	3 Litre	240	120
NS50/32QT	3.7	6	4 Litre	220	65	NS100/26QM	3.7	6	3 Litre	240	120
NS50/32QT	5.5	6	4 Litre	220	65	NS100/26QM	5.5	6	3 Litre	240	120
NS50/36QM	3.7	6	4 Litre	220	65	NS100/26QT	3.7	6	3 Litre	240	120
NS50/36QM	5.5	6	4 Litre	220	65	NS100/26QT	5.5	6	3 Litre	240	120
NS65/32NB	2.2	6	4 Litre	235	75	NS150/26NB	3.7	6	3 Litre	310	155
NS65/32NB	3.7	6	4 Litre	230	75	NS150/26NB	5.5	6	3 Litre	310	155
NS65/32NB	5.5	6	4 Litre	230	75	NS150/26N	3.7	6	3 Litre	310	155
NS65/32N	2.2	6	4 Litre	235	75	NS150/26N	5.5	6	3 Litre	310	155
NS65/32N	3.7	6	4 Litre	230	75	NS150/26NM	3.7	6	3 Litre	310	155
NS65/32N	5.5	6	4 Litre	230	75	NS150/26NM	5.5	6	3 Litre	310	155
NS65/32Q	2.2	6	4 Litre	235	75	NS150/26Q	3.7	6	3 Litre	310	155
NS65/32Q	3.7	6	4 Litre	230	75	NS150/26Q	5.5	6	3 Litre	310	155
NS65/32Q	5.5	6	4 Litre	230	75	NS150/26QMB	3.7	6	3 Litre	310	155
NS65/32QMB	2.2	6	4 Litre	235	75	NS150/26QMB	5.5	6	3 Litre	310	155
NS65/32QMB	3.7	6	4 Litre	230	75	NS150/26QM	3.7	6	3 Litre	310	155
NS65/32QMB	5.5	6	4 Litre	230	75	NS150/26QM	5.5	6	3 Litre	310	155
NS65/32QM	2.2	6	4 Litre	235	75	NS150/26QNB	3.7	6	3 Litre	310	155
NS65/32QM	3.7	6	4 Litre	230	75	NS150/26QNM	5.5	6	3 Litre	310	155
NS65/32QM	5.5	6	4 Litre	230	75	NS150/26QT	3.7	6	3 Litre	310	155
NS65/32QT	2.2	6	4 Litre	235	75	NS150/26QT	5.5	6	3 Litre	310	155
NS65/32QT	3.7	6	4 Litre	230	75	NS40/32QT	2.2	6	4 Litre	170	55
NS65/32QT	5.5	6	4 Litre	230	75	NS50/26NB	3.7	6	3 Litre	180	65
NS80/26N	3.7	6	3 Litre	220	85	NS50/26NB	5.5	6	3 Litre	180	65
NS80/26N	5.5	6	3 Litre	220	85	NS50/26NB	2.2	6	3 Litre	180	65
NS80/26Q	3.7	6	3 Litre	220	85	NS50/26N	3.7	6	3 Litre	180	65
NS80/26Q	5.5	6	3 Litre	220	85	NS50/26N	5.5	6	3 Litre	180	65
NS80/26QM	3.7	6	3 Litre	220	85	NS50/26N	2.2	6	3 Litre	180	65
NS80/26QM	5.5	6	3 Litre	220	85	NS50/26Q	3.7	6	3 Litre	180	65
NS80/26QT	3.7	6	3 Litre	220	85	NS50/26Q	5.5	6	3 Litre	180	65
NS80/26QT	5.5	6	3 Litre	220	85	NS50/26Q	2.2	6	3 Litre	185	65
NS80/26QT	5.5	6	3 Litre	220	85	NS50/26QMB	3.7	6	3 Litre	180	65
NS80/40N	18.5	4	8 Litre	287	85	NS50/26QMB	5.5	6	3 Litre	180	65
NS80/40N	22	4	8 Litre	297	85	NS50/26QMB	2.2	6	3 Litre	185	65

NOTE: change oil after every 5000 hrs of pump operation.

8 OVERHAULING:

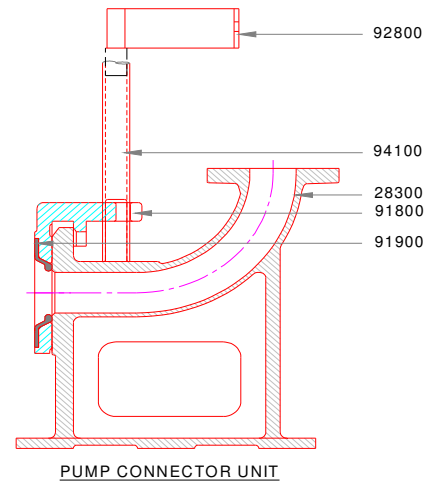
Overhauling of the pump or any part of it, at site, is not permitted. In case of doubt, please consult our service division.

Do not handle the pump with the use of cable.

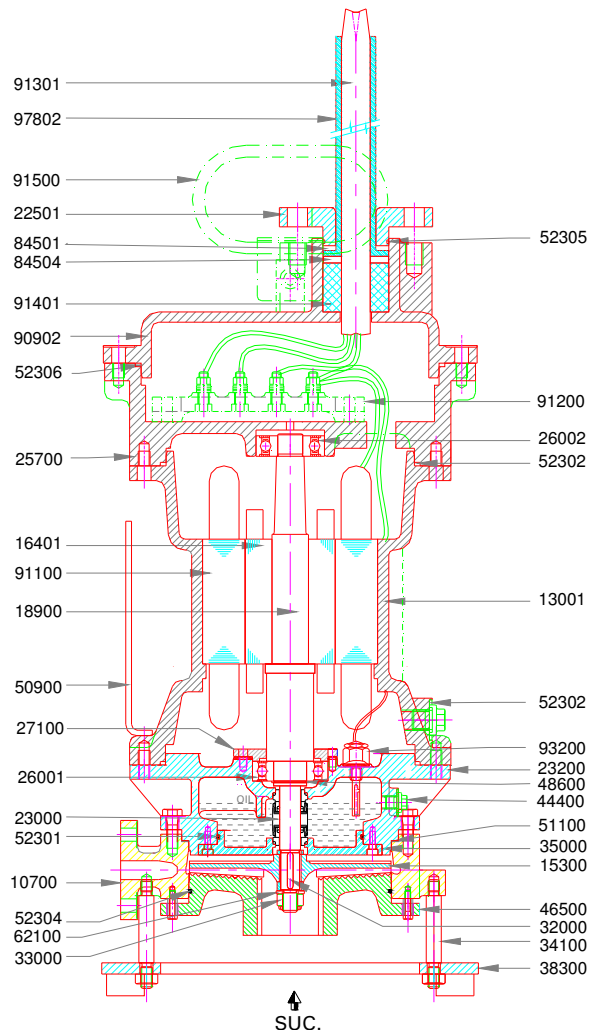
9 CROSS SECTIONAL DRAWING

9.1 (UNIT 1,2,3,4,5,6- iNS Connector Unit)

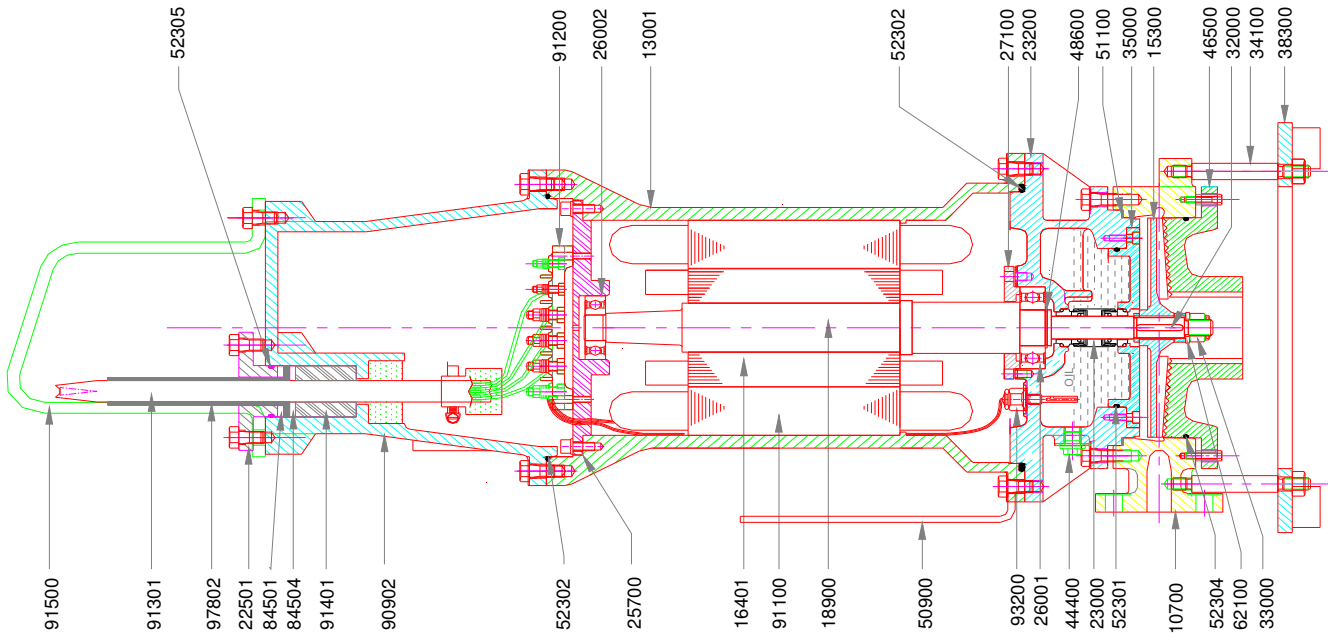
New modified Duck Foot Bend integrated with Support Bracket is supplied for stationary Arrangement.



9.2 (UNIT 1- iNS with QT Type Impeller and DOL type of starting)

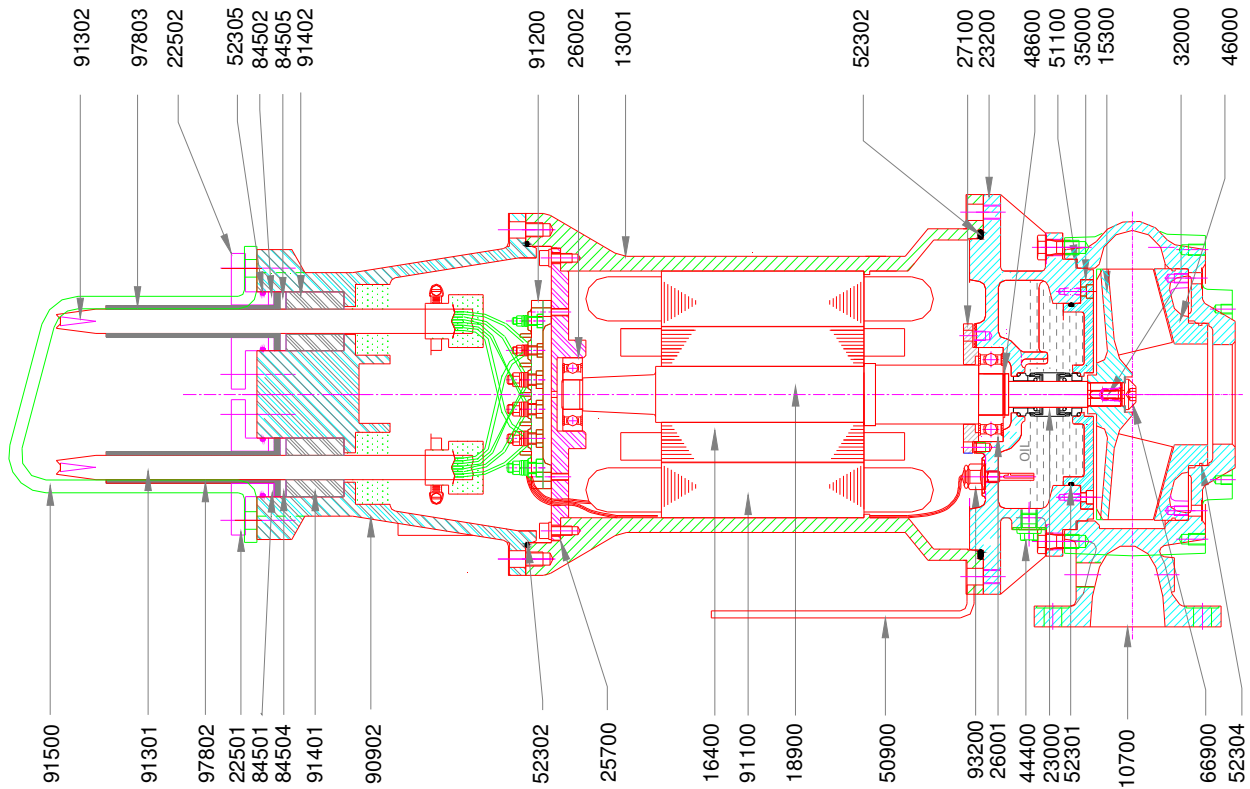


9.3(UNIT 2,3,4,5,6- iNS with QT Type Impeller and DOL type of starting)



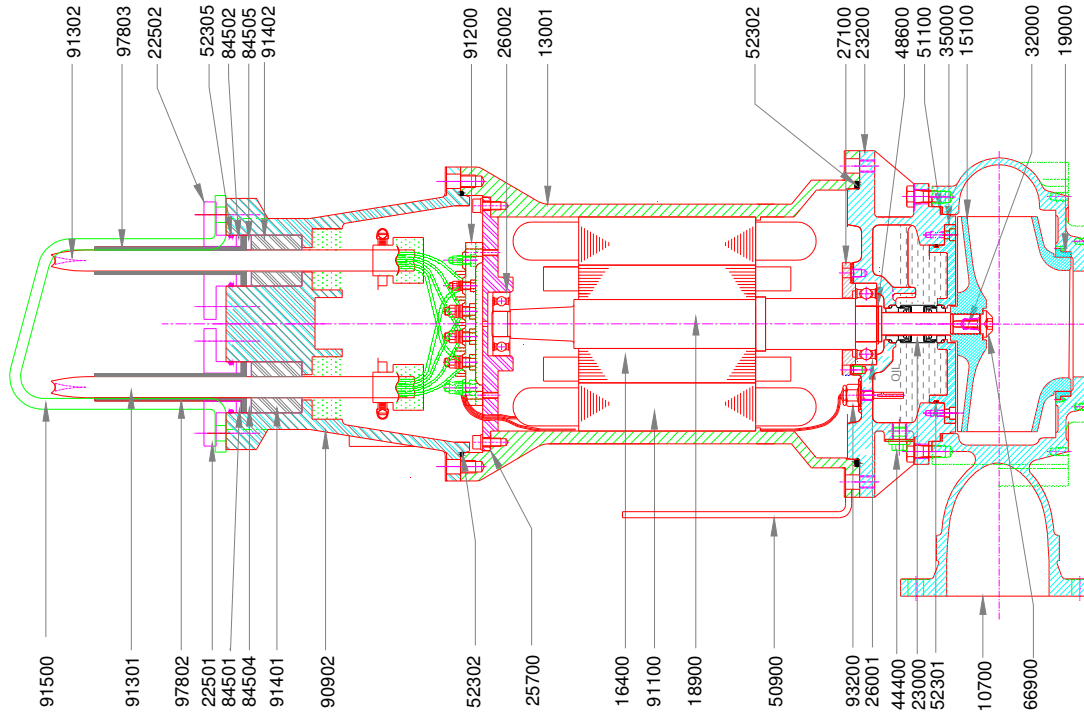
UNIT 2,3,4,5,6- iNS with QT Type Impeller and DOL type of starting

9.4(UNIT 2,3,4,5,6- iNS with Q Type Impeller and SDS type of starting)



UNIT 2,3,4,5,6- iNS with Q Type Impeller and SDS type of starting

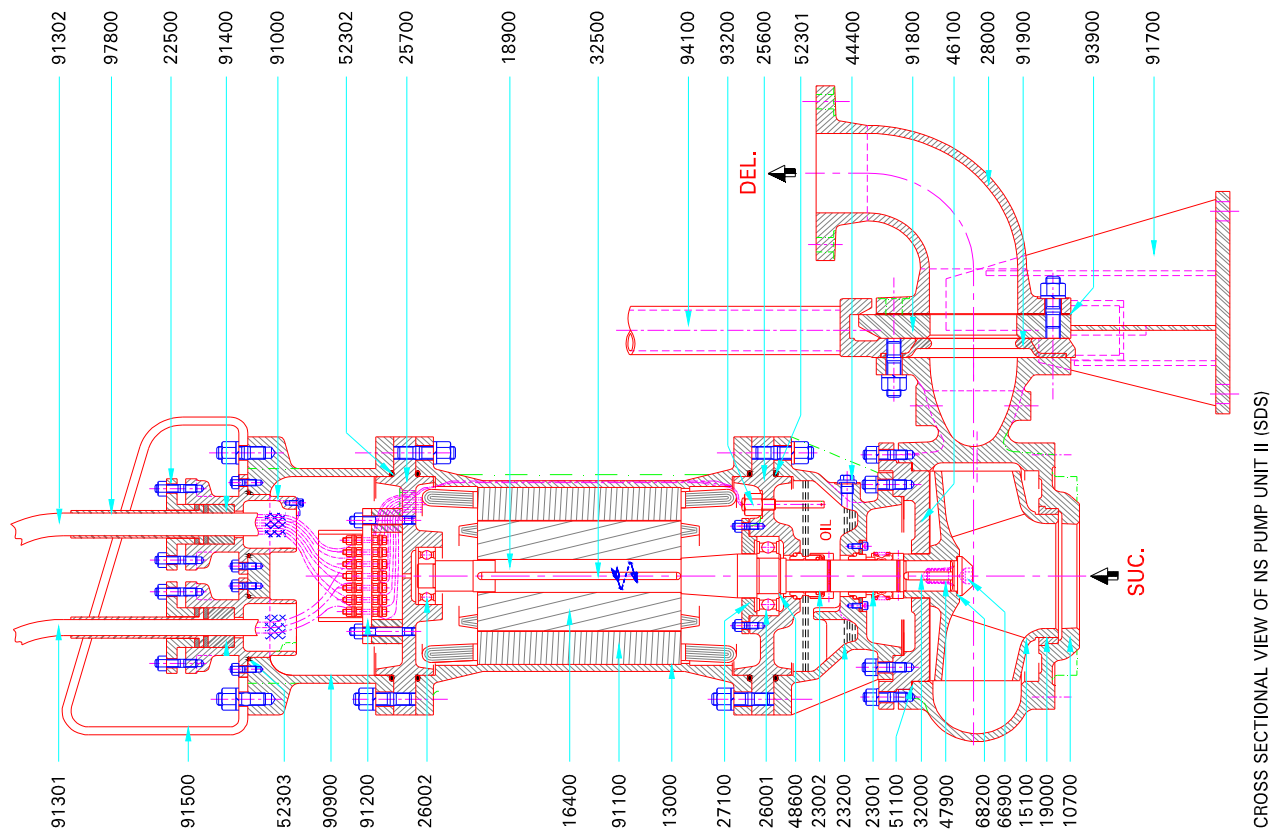
9.5 (UNIT 2,3,4,5,6- iNS with N Type Impeller and SDS type of starting)



6.5 (UNIT 2,3,4,5,6- iNS with N Type Impeller and SDS type of starting)

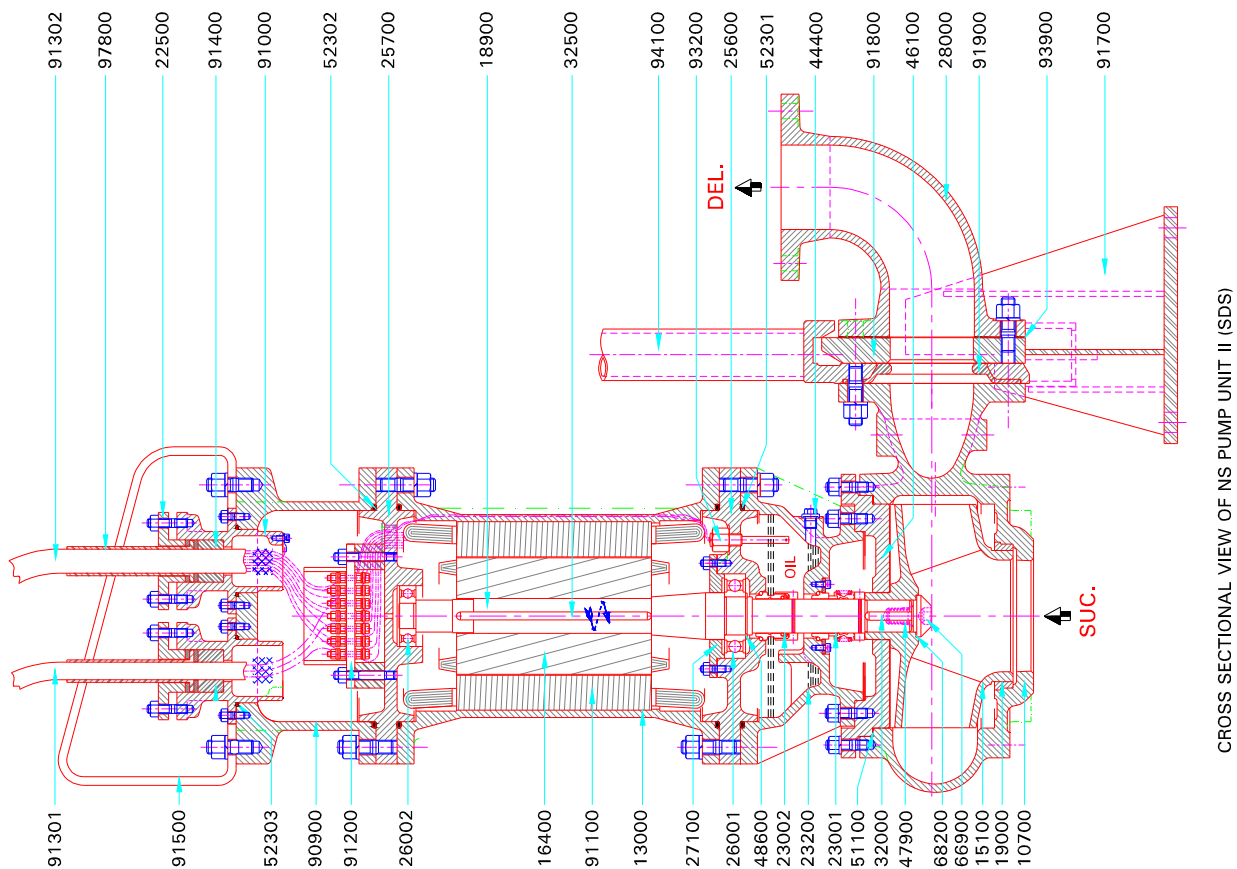
9.5 CROSS SECTIONAL VIEW OF NS PUMP

CROSS SECTIONAL VIEW OF NS PUMP QT TYPE IMPELLER UNIT I (DOL)



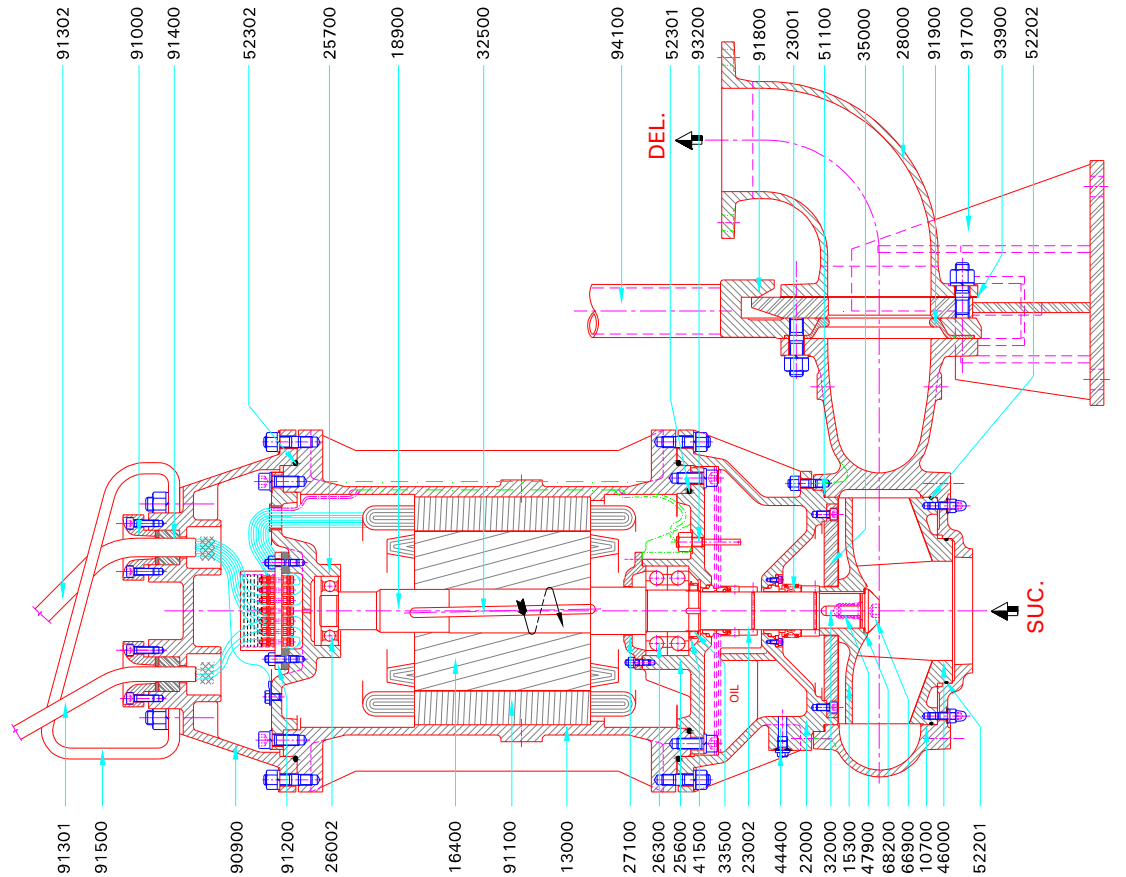
CROSS SECTIONAL VIEW OF NS PUMP UNIT II (SDS)

9.7 CROSS SECTIONAL VIEW OF NS PUMP N TYPE IMPELLER UNIT II (SDS)



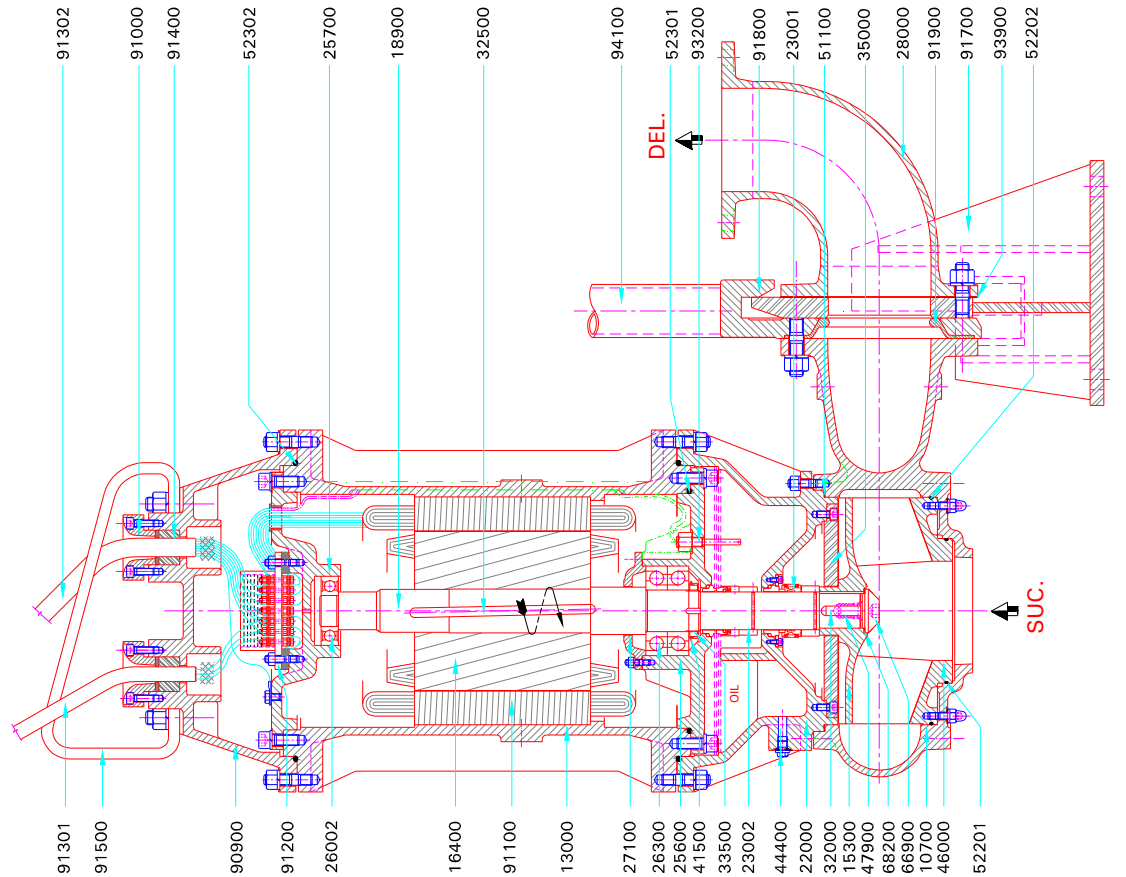
9.8 CROSS SECTIONAL VIEW OF NS PUMP UNIT III – N TYPE IMPELLER (SDS)

9.9 CROSS SECTIONAL VIEW OF NS PUMP UNIT III – Q TYPE IMPELLER (SDS)

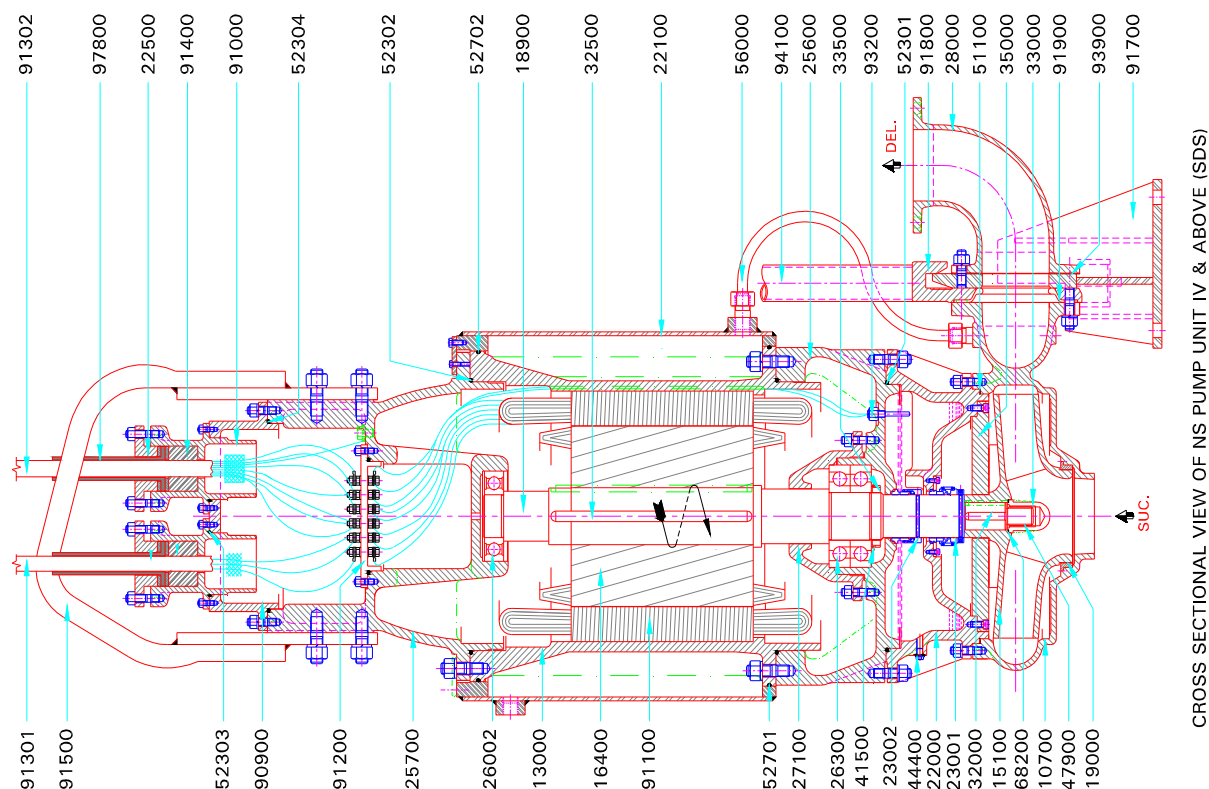


CROSS SECTIONAL VIEW OF NS PUMP UNIT III – Q TYPE IMPELLER (SDS)

9.10 CROSS SECTIONAL VIEW OF NS PUMP UNIT IV & ABOVE (SDS)



CROSS SECTIONAL VIEW OF NS PUMP UNIT III – N TYPE IMPELLER (SDS)



CROSS SECTIONAL VIEW OF NS PUMP UNIT IV & ABOVE (SDS)

9.10. Pump Part list

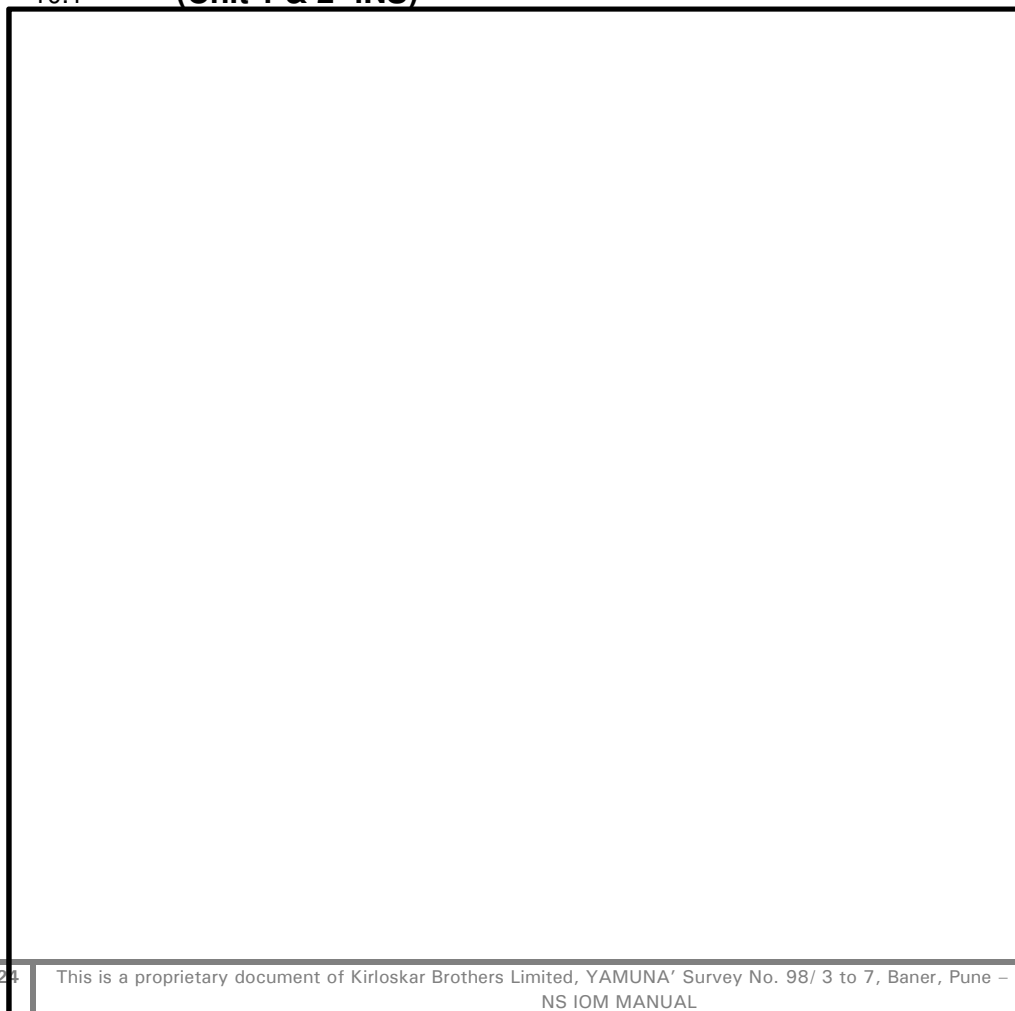
PARTCD	PARTDESC	PARTCD	PARTDESC
10700	PUMP CASING	59005	STUD FOR BEARING COVER
13001	STATOR HOUSING	59006	STUD FOR PUMP CASING AND SUCTION PLATE
15100*	ENCLOSED IMPELLER	59008	STUD FOR UPP BRG HOLDER AND ST HOUSING
15300*	SEMIOPEN IMPELLER	62100	WASHER FOR IMPELLER NUT
16401	ROTOR WITH SHAFT	63001	RELEASE SCREW FOR MECH SEAL HSG/LOW BRG HOLDER/MOT END COV
18900	SHAFT	63002	HEX RELEASE SCREW FOR SUCTION PLATE
19000*	CASING RING	64001	RIVET FOR OIL NAME PLATE
20900	SPACER FOR SUCTION PLATE	64002	RIVET FOR DUTY NAME PLATE
22401	HOSE CLIP FOR POTTING CUP FOR POW+CON CABLE	66900*	SCREW FOR IMPELLER
22402	HOSE CLIP FOR POTTING CUP FOR POWER CABLE	67000	DUTY NAME PLATE
22501	BUSH FOR POWER+CONTROL CABLE-DOL	67300	OIL NAME PLATE
22503	BUSH FOR POWER CABLE-SDS	68200*	GASKET FOR IMPELLER SCREW
23000*	DOUBLE MECHANICAL SEAL	69200	HEX NUT FOR FOUNDATION BOLT
24600	CABLE BRACKET	70101	SPRING WASHER FOR NUT OF LOW BEARING HOLDER AND CASING
25600	LOWER BEARING HOLDER/MECH SEAL HOUSING	70102	SPRING WASHER FOR NUT OF LOW BRG HOLDER AND ST HOUSING
25700	UPPER BEARING HOLDER	70103	SPRING WASHER FOR MOTOR END COVER AND STATOR HOUSING
26001*	DEEP GROOVE BALL BEARING LOWER	70105	SPRING WASHER FOR BEARING COVER
26002*	DEEP GROOVE BALL BEARING UPPER	70107	SPRING WASHER FOR STAND NUT
27100	BEARING COVER FOR LOWER BEARING	82800	STUD FOR GUIDE SHOE
28300	DUCK FOOT BEND	84000	WASHER FOR NUT FOR FOUNDATION BOLT
30400	FOUNDATION BOLT	84501	WAHSER FOR POWER+CONTROL CABLE
32000*	KEY FOR IMPELLER	84502	WASHER FOR POWER CABLE
33000*	IMPELLER NUT	84504	WASHER FOR PROTECTION TUBE POWE+CONT CABLE
34100	TIE ROD FOR STAND-PORTABLE	84505	WASHER FOR PROTECTION TUBE POWE CABLE
35000	STUFFING BOX BUSH	84900	WASHER FOR EARTHIN SCREW
38300	SUPPORT PLATE FOR STAND-PORTABLE	84901	WASHER FOR TERMINAL BOARD
44001	POTTING CUP FOR POWER+CONTROL CABLE-DOL	85600	SPRING WASHER FOR HEX SCREW FOR PUMP CASING AND GUIDE SHOE
44003	POTTING CUP FOR POWER CABLE-SDS	85700	NUT FOR GUIDE SHOE
44400	PLUG FOR INSPECTION	88400	TIE FOR CABLE
46000*	WEAR PLATE	88501	PIN TYPE LUG-FOR CONTROL CABLE
46500*	SUCTION PLATE	88502	PIN TYPE LUG FOR POWER CABLE
47100	PROTECTION COVER FOR DELIVERY	88504	CRIMPING RING TERMINALS FOR CONTROL CABLE
47101	PROTECTION CAP FOR SCREW	88505	CRIMPING RING TERMINAL FOR POWER CABLE
47900	HELICOIL LOCK INSERT FOR IMPELLER SCREW	90901	MOTOR END COVER

48600	EXTERNAL CIRCLIP FOR LOWER BEARING	91100	STATOR-F CLASS STD
50900	CABLE BRACKET	91201	TERMINAL BOARD
51100*	GASKET FOR PUMP CASING & LOW BRG HOLDER/MECH SEAL HSG	91301	POWER+CONTROL CABLE
52301*	O-RING FOR UPPER BEARING HOLDER / STATOR HOUSING	91302	POWER CABLE
52302*	O-RING FOR LOWER BEARING HOLDER / STATOR HOUSING	91401*	CABLE SEAL FOR POWER+CONTROL CABLE
52303*	O-RING FOR OIL FILLING PLUG/INSPECTION	91402*	CABLE SEAL FOR POWER CABLE
52304*	O-RING FOR SUCTION PLATE/WEAR PLATE	91500	HANDLE
52305*	O-RING FOR FOR MOTOR END COVER	91800	GUIDE SHOE
52306*	O-RING FOR STUFFING BOX BUSH	91900	RUBBER DIAPHRGAM
52307*	O-RING FOR COOLING CHAMBER	92000	STAND
52308*	O-RING FOR INSPECTION PLUG	92800	GUIDE PIPE HOLDER
55901	GUIDE PIPE ADAPTOR	93200	MOISTURE SENSOR
55902	ADAPTOR PIECE FOR GUIDE PIPE	93800	THERMISTOR
58201	HEX NUT FOR STUD OF PUMP CASING AND LOW BRG HOLDER	94100	GUIDE PIPE
58202	HEX NUT FOR LOW BRG HOLDER AND STATOR HOUSING	94300	HEX NUT FOR TERMINAL BOARD
58203	HEX NUT FOR MOTOR END COVER AND STAT HOUSING	97801*	PROTECTION TUBE FOR POWER+CONTROL CABLE
58204	HEX NUT FOR BUSH AND MOTOR END COVER-SDS	97802*	PROTECTION TUBE FOR POWER CABLE
58205	NUT OF BEARING COVER	98900	HEX. SOCKET HEAD CAP SCREW FOR STUFFING BOX BUSH
58206	NUT FOR SUCTION PLATE	98901	HEX SOC CAP SCREW FOR EARTHING
58207	NUT FOR STAND	98903	HEX SOC CAP SCREW FOR GUIDE PIPE ADAPTOR
58208	HEX NUT FOR STUD OF UPPER BEARING HOLDER	98904	HEX SOC CAP SCREW FOR ST HOUSING AND LOW BRG HOLDER
59001	STUD FOR PUMP CASING AND LOW BRG HOLDER	98905	HEX SOC CAP SCREW FOR ST HOUSING AND MOTOR END COVER
59002	STUD FOR LOW BRG HOLDER AND STATOR HOUSING	98906	HEX SCREW FOR CABLE BRACKET
59003	STUD FOR STATOR HOUSING AND MOTOR END COVER	98907	HEX SCREW FOR BEARING COVER
59004	STUD FOR BUSH AND MOT END COVER-SDS		

* Marked part code nos. are recommended spares.

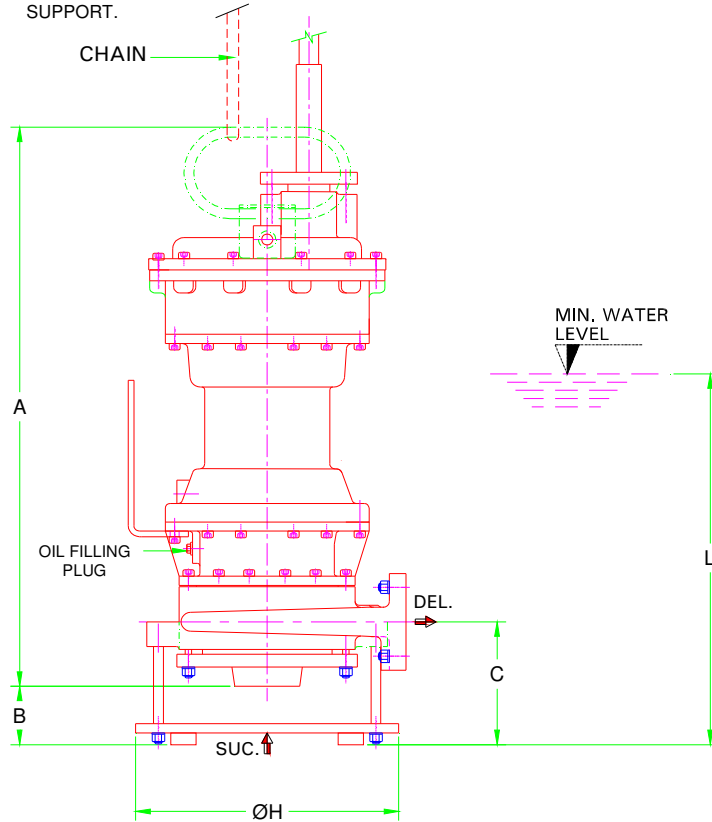
10 OUTLINE DRAWING & DIMENSIONS SHEET

10.1 (Unit 1 & 2- iNS)

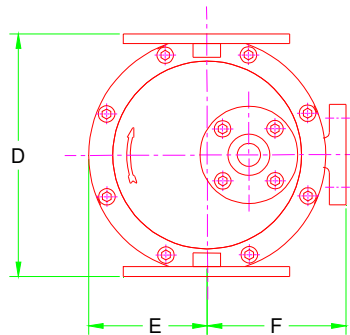




TO BE SUSPENDED
FROM SUITABLE
SUPPORT.



FRONT VIEW

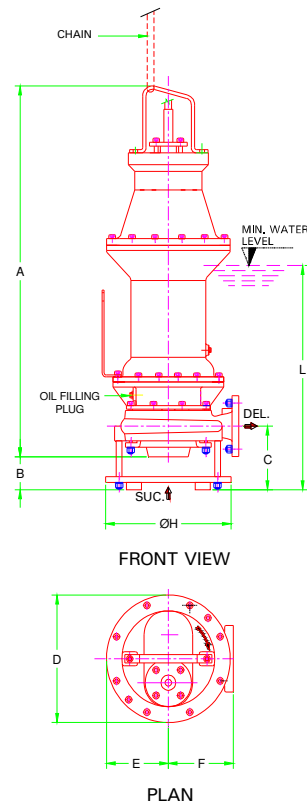


PLAN

Pump	UNIT	A	B	C	E	F	D	H	L
NS20/13QT	1	580	80	150	145	150	290	290	450
NS20/13QT	2	625	80	150	145	150	290	290	500
NS32/13QT	2	762	133	203	175	150	350	350	550
NS40/13QT	2	610	81	150	180	150	360	360	500

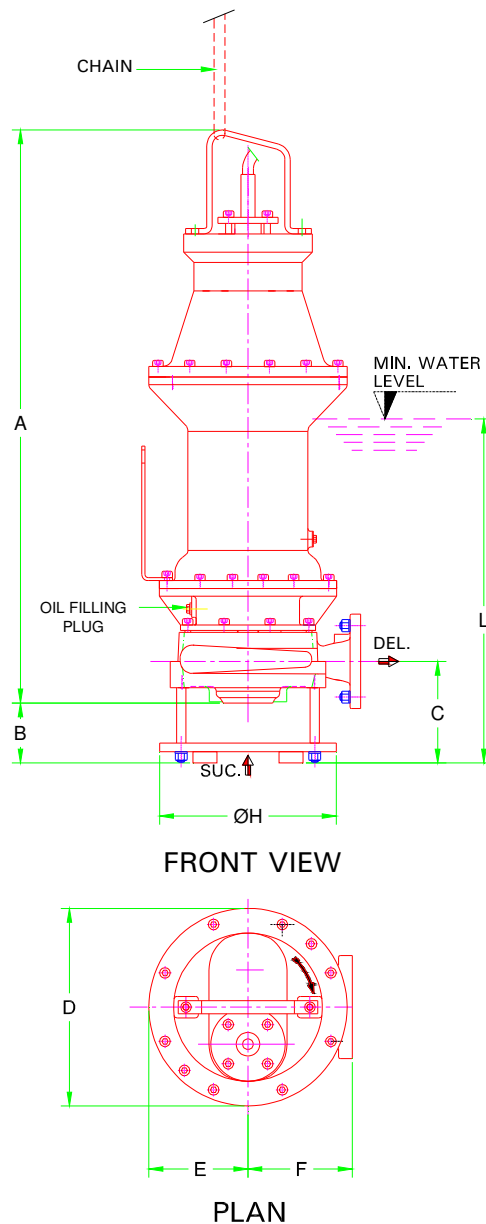
10.2 (Unit 3,4,4a,5,6- QT, QM, QMB type Impeller iNS)

Pump	UNIT	A	B	C	E	F	D	H	L
NS20/16QT	3	910	159	227	175	180	350	350	600
NS20/20QT	3	920	81	150	175	180	350	350	550
NS32/13QT	3	915	133	203	175	150	350	350	600
NS32/16QT	3	940	132	227	175	180	350	350	600
NS40/13QT	3	915	81	150	180	150	360	360	500
NS40/16QT	3	940	170	290	230	190	460	460	800
NS50/13QT	3	950	135	235	175	180	350	350	600
NS20/16QT	4	1005	159	227	175	180	350	350	600
NS20/20QT	4	1015	81	150	175	180	350	350	600
NS32/16QT	4	1035	132	227	175	180	350	350	700
NS40/13QT	4	1010	81	150	180	150	360	360	600
NS40/16QT	4	1035	132	228	175	190	350	350	700
NS50/13QT	4	1040	135	235	175	180	350	350	700
NS65/13QT	4	1040	145	245	225	200	450	450	700
NS20/16QT	4	1005	159	227	175	180	350	350	600
NS20/20QT	4	1015	81	150	175	180	350	350	600
NS32/16QT	4	1035	132	227	175	180	350	350	700
NS40/16QT	4	1035	132	228	175	190	350	350	700
NS50/13QT	4	1040	135	235	175	180	350	350	700
NS50/16QT	4	1003	135	195	175	200	350	350	650
NS65/13QT	4	1040	145	245	225	200	450	450	700
NS40/20QT	3	932	75	150	213	200	425	425	550
NS40/32QT	3	960	175	290	275	275	550	550	800
NS50/20QT	3	935	175	250	213	230	425	425	650
NS40/20QT	4a	1025	75	150	213	200	425	425	550
NS40/32QT	4a	1055	80	200	260	275	520	520	650
NS50/20QT	4a	1030	175	250	213	230	425	425	650
NS50/26QM	4a	1065	180	250	250	245	500	500	700
NS50/26QMB	4a	1065	180	250	250	245	500	500	700
NS50/26QT	4a	1065	180	250	250	245	500	500	700
NS40/32QT	4	1055	80	200	260	275	520	520	700
NS50/20QT	4	1030	175	250	213	230	425	425	650
NS50/26QM	4	1065	180	250	250	245	500	500	750
NS50/26QMB	4	1065	180	250	250	245	500	500	750
NS50/26QT	4	1065	180	250	250	245	500	500	750
NS80/26QM	4	1085	160	265	250	245	500	500	750
NS80/26QT	4	1085	160	265	250	245	500	500	750
NS40/32QT	4	1055	80	200	260	275	520	520	700
NS50/26QM	4	1065	180	250	250	245	500	500	750
NS50/26QMB	4	1065	180	250	250	245	500	500	750
NS50/26QT	4	1065	180	250	250	245	500	500	750
NS50/32QM	4	1077	155	254	270	280	540	540	750
NS50/32QT	4	1077	155	254	270	280	540	540	750
NS65/32QM	4	1070	158	250	270	275	540	540	750
NS65/32QMB	4	1070	158	250	270	275	540	540	750
NS65/32QT	4	1070	158	250	270	275	540	540	750
NS80/26QM	4	1085	160	265	250	245	500	500	750
NS80/26QT	4	1085	160	265	250	245	500	500	750
NS100/26QM	4	1105	175	290	275	275	550	550	800
NS100/26QT	4	1105	175	290	275	275	550	550	800
NS100/26QM	4	1105	175	290	275	275	550	550	800
NS100/26QT	4	1105	175	290	275	275	550	550	800
NS40/32QT	4a	1055	80	200	260	275	520	520	700
NS50/26QM	4a	1065	180	250	250	245	500	500	750
NS50/26QMB	4a	1065	180	250	250	245	500	500	750
NS50/26QT	4a	1065	180	250	250	245	500	500	750
NS50/32QM	4a	1077	155	254	270	280	540	540	750
NS50/32QT	4a	1077	155	254	270	280	540	540	750
NS65/32QM	4a	1070	158	250	270	275	540	540	750
NS65/32QMB	4a	1070	158	250	270	275	540	540	750
NS65/32QT	4a	1070	158	250	270	275	540	540	750



Pump	UNIT	A	B	C	E	F	D	H	L
NS150/26QM	4	1150	165	325	275	350	550	550	750
NS150/26QMB	4	1150	165	325	275	350	550	550	750
NS150/26QMB	4	1150	165	325	275	350	550	550	750
NS150/26QT	4	1150	165	325	275	350	550	550	750
NS50/26QM	4	1065	180	250	250	245	500	500	750
NS50/26QMB	4	1065	180	250	250	245	500	500	750
NS50/26QT	4	1065	180	250	250	245	500	500	750
NS50/32QM	4	1077	155	254	270	280	540	540	750
NS50/32QT	4	1077	155	254	270	280	540	540	750
NS50/36QM	4	1115	130	250	308	330	615	615	1250
NS65/32QM	4	1070	158	250	270	275	540	540	750
NS65/32QMB	4	1070	158	250	270	275	540	540	750
NS65/32QT	4	1070	158	250	270	275	540	540	750
NS80/26QM	4	1085	160	265	250	245	500	500	750
NS80/26QT	4	1085	160	265	250	245	500	500	750
NS100/26QT	4	1105	175	290	275	275	550	550	800
NS150/26QM	4	1150	165	325	275	350	550	550	750
NS150/26QMB	4	1150	165	325	275	350	550	550	750
NS150/26QNM	4	1150	165	325	275	350	550	550	750
NS150/26QT	4	1150	165	325	275	350	550	550	750
NS50/26QM	4	1065	180	250	250	245	500	500	750
NS50/26QMB	4	1065	180	250	250	245	500	500	750
NS50/26QT	4	1065	180	250	250	245	500	500	750
NS50/32QM	4	1077	155	254	270	280	540	540	750
NS50/32QT	4	1077	155	254	270	280	540	540	750
NS50/36QM	4	1115	130	250	308	330	615	615	1250
NS65/32QM	4	1070	158	250	270	275	540	540	750
NS65/32QMB	4	1070	158	250	270	275	540	540	750
NS65/32QT	4	1070	158	250	270	275	540	540	750
NS80/26QM	4	1085	160	265	250	245	500	500	750
NS80/26QT	4	1085	160	265	250	245	500	500	750

10.2.1 (Unit 3,4,4a,5,6- Q, N, NM, NB type Impeller iNS)



Pump	UNIT	A	B	C	E	F	D	H	L
NS50/26N	4a	1080	165	250	230	245	460	460	700
NS50/26NB	4a	1080	165	250	230	245	460	460	700
NS50/26Q	4a	1080	165	250	230	245	460	460	700
NS50/26N	4	1080	165	250	230	245	460	460	750
NS50/26NB	4	1080	165	250	230	245	460	460	750
NS50/26Q	4	1080	165	250	230	245	460	460	750
NS80/26N	4	1095	150	265	230	245	460	460	750
NS80/26Q	4	1095	150	265	230	245	460	460	750
NS100/26N	4	1110	170	290	230	275	460	460	800
NS50/26N	4	1080	165	250	230	245	460	460	750
NS50/26NB	4	1080	165	250	230	245	460	460	750
NS50/26Q	4	1080	165	250	230	245	460	460	750
NS50/32N	4	1087	145	254	250	280	500	500	750
NS65/32N	4	1050	138	250	250	275	500	500	750
NS65/32NB	4	1050	138	250	250	275	500	500	750
NS65/32Q	4	1050	138	250	250	275	500	500	750
NS80/26N	4	1095	150	265	230	245	460	460	750
NS80/26Q	4	1095	150	265	230	245	460	460	750
NS100/26Q	4	1110	170	290	230	275	460	460	800
NS100/26N	4	1110	170	290	230	275	460	460	800
NS100/26N	4	1110	170	290	230	275	460	460	800
NS100/26Q	4	1110	170	290	230	275	460	460	800
NS100/26Q	4	1110	170	290	230	275	460	460	800
NS50/26N	4a	1080	165	250	230	245	460	460	750
NS50/26NB	4a	1080	165	250	230	245	460	460	750
NS50/26Q	4a	1080	165	250	230	245	460	460	750
NS50/32N	4a	1087	145	254	250	280	500	500	750
NS65/32N	4a	1050	138	250	250	275	500	500	750
NS65/32NB	4a	1050	138	250	250	275	500	500	750
NS65/32Q	4a	1050	138	250	250	275	500	500	750
NS150/26N	4	1170	175	325	230	350	460	460	900
NS150/26NB	4	1170	175	325	230	350	460	460	900
NS150/26NM	4	1170	175	325	230	350	460	460	900
NS150/26Q	4	1170	175	325	230	350	460	460	900
NS50/26N	4	1080	165	250	230	245	460	460	750
NS50/26NB	4	1080	165	250	230	245	460	460	750
NS50/26Q	4	1080	165	250	230	245	460	460	750
NS50/32N	4	1087	145	254	250	280	500	500	750
NS65/32N	4	1050	138	250	250	275	500	500	750
NS65/32NB	4	1050	138	250	250	275	500	500	750
NS65/32Q	4	1050	138	250	250	275	500	500	750
NS80/26N	4	1095	150	265	230	245	460	460	750
NS80/26Q	4	1095	150	265	230	245	460	460	750
NS150/26N	4	1170	175	325	230	350	460	460	900
NS150/26NB	4	1170	175	325	230	350	460	460	900
NS150/26NM	4	1170	175	325	230	350	460	460	900
NS150/26Q	4	1170	175	325	230	350	460	460	900
NS50/26N	4	1080	165	250	230	245	460	460	750
NS50/26NB	4	1080	165	250	230	245	460	460	750
NS50/26Q	4	1080	165	250	230	245	460	460	750
NS50/32N	4	1087	145	254	250	280	500	500	750
NS65/32N	4	1050	138	250	250	275	500	500	750
NS65/32NB	4	1050	138	250	250	275	500	500	750
NS65/32Q	4	1050	138	250	250	275	500	500	750
NS80/26N	4	1095	150	265	230	245	460	460	750
NS80/26Q	4	1095	150	265	230	245	460	460	750

10.3 (Unit 1&2- Q, N type Impeller NS)

KIRLOSKAR BROTHERS LIMITED

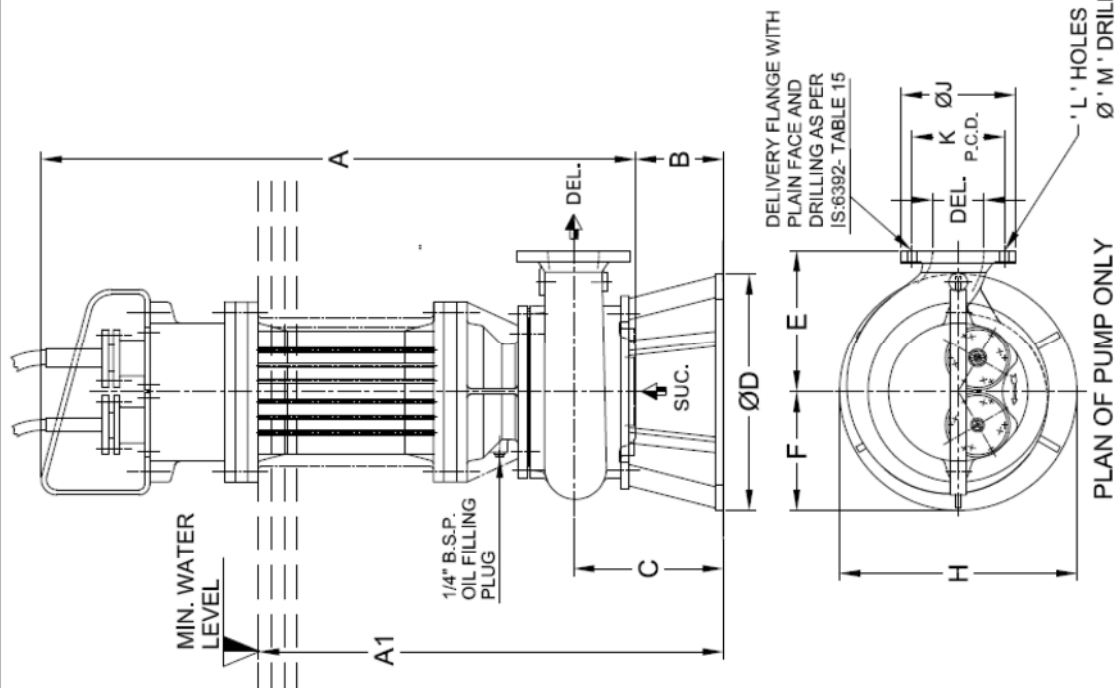
GENERAL DIMENSIONS
TRANSPORTABLE INSTALLATION II

SR. NO.	PUMP TYPE	MOTOR UNIT	SUCTION & DELIVERY NOMINAL SIZE		A	B	C	D	E	F	H	J DIA.	K P.C.D.	L M	A1
			NWS	NWD											
01	NS 50 / 26	I	65	50	1035	150	250	400	245	225	460	165	125	4 18	900
02	NS 50 / 32	II	65	50	1125	140	250	500	280	250	500	165	125	4 18	900
03	NS 50 / 36	II	65	50	1140	125	250	550	330	275	550	165	125	4 18	900
04	NS 65 / 32	I	80	65	1045	140	250	500	275	250	500	185	145	4 18	900
05	NS 65 / 32	II	80	65	1125	140	250	500	275	250	500	185	145	4 18	900
06	NS 80 / 26	I	100	80	1050	150	265	500	245	250	500	200	160	8 18	900
07	NS 80 / 26	II	100	80	1130	150	265	500	245	250	500	200	160	8 18	900
08	NS 80 / 40	II	100	80	1135	165	265	550	350	275	550	200	160	8 18	900
09	NS 100 / 26	I	125	100	1070	170	290	460	275	230	460	220	180	8 18	1000
10	NS 100 / 26	II	125	100	1150	170	290	460	275	230	460	220	180	8 18	1000
11	NS 100 / 32	II	125	100	1150	170	290	500	310	250	500	220	180	8 18	1000
12	NS 150 / 26	II	150	150	1180	185	325	460	350	230	460	285	240	8 23	1000
13	NS 150 / 32	II	150	150	1175	190	325	500	395	250	500	285	240	8 23	1000

NOTES :- 1) ALL DIMENSIONS ARE IN mm EXCEPT SPECIFIED
2) DO NOT SCALE THE DRAWING

The diagram illustrates the physical dimensions of the pump assembly. The side view shows the pump mounted on a base, with dimensions A (total height), B (base height), C (motor height), D (pump body height), E (flange height), F (flange diameter), G (flange thickness), H (total width), and I (motor width). The plan view shows the pump from above, with dimensions J (flange diameter), K (flange thickness), L (flange width), M (flange height), N (flange diameter), O (flange thickness), P (flange width), Q (flange height), R (flange diameter), S (flange thickness), T (flange width), U (flange height), V (flange diameter), W (flange thickness), X (flange width), Y (flange height), Z (flange diameter), AA (flange thickness), AB (flange width), AC (flange height), AD (flange diameter), AE (flange thickness), AF (flange width), AG (flange height), AH (flange diameter), AI (flange thickness), AJ (flange width), AK (flange height), AL (flange diameter), AM (flange thickness), AN (flange width), AO (flange height), AP (flange diameter), AQ (flange thickness), AR (flange width), AS (flange height), AT (flange diameter), AU (flange thickness), AV (flange width), AW (flange height), AX (flange diameter), AY (flange thickness), AZ (flange width), BA (flange height), BB (flange diameter), BC (flange thickness), BD (flange width), BE (flange height), BF (flange diameter), BG (flange thickness), BH (flange width), BI (flange height), BJ (flange diameter), BK (flange thickness), BL (flange width), BM (flange height), BN (flange diameter), BO (flange thickness), BP (flange width), BQ (flange height), BR (flange diameter), BS (flange thickness), BT (flange width), BU (flange height), BV (flange diameter), BW (flange thickness), BX (flange width), BY (flange height), BZ (flange diameter), CA (flange thickness), CB (flange width), CC (flange height), CD (flange diameter), CE (flange thickness), CF (flange width), CG (flange height), CH (flange diameter), CI (flange thickness), CJ (flange width), CK (flange height), CL (flange diameter), CM (flange thickness), CN (flange width), CO (flange height), CP (flange diameter), CQ (flange thickness), CR (flange width), CS (flange height), CT (flange diameter), CU (flange thickness), CV (flange width), CW (flange height), CX (flange diameter), CY 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width), IL (flange height), IM (flange diameter), IN (flange thickness), IO (flange width), IP (flange height), IQ (flange diameter), IR (flange thickness), IS (flange width), IT (flange height), IU (flange diameter), IV (flange thickness), IW (flange width), IX (flange height), IY (flange diameter), IZ (flange thickness), JA (flange height), JB (flange diameter), JC (flange thickness), JD (flange width), JE (flange height), JF (flange diameter), JG (flange thickness), JH (flange width), JI (flange height), JJ (flange diameter), JK (flange thickness), JL (flange width), JM (flange height), JN (flange diameter), JO (flange thickness), JP (flange width), JQ (flange height), JR (flange diameter), JS (flange thickness), JT (flange width), JU (flange height), JV (flange diameter), JW (flange thickness), JX (flange width), JY (flange height), JZ (flange diameter), KA (flange width), KB (flange height), KC (flange diameter), KD (flange thickness), KE (flange width), KF (flange height), KG 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height), TK (flange diameter), TL (flange thickness), TM (flange width), TN (flange height), TO (flange diameter), TP (flange thickness), TQ (flange width), TR (flange height), TS (flange diameter), TT (flange thickness), TU (flange width), TV (flange height), TW (flange diameter), TX (flange thickness), TY (flange width), TZ (flange height), UA (flange diameter), UB (flange thickness), UC (flange width), UD (flange height), UE (flange diameter), UF (flange thickness), UG (flange width), UH (flange height), UI (flange diameter), UJ (flange thickness), UK (flange width), UL (flange height), UM (flange diameter), UN (flange thickness), UO (flange width), UP (flange height), UQ (flange diameter), UR (flange thickness), US (flange width), UT (flange height), UU (flange diameter), UV (flange thickness), UW (flange width), UX (flange height), UY (flange diameter), UZ (flange thickness), VA (flange height), VB (flange diameter), VC (flange thickness), VD (flange width), VE (flange height), VF (flange diameter), VG (flange thickness), VH (flange width), VI (flange height), VJ (flange diameter), VK (flange thickness), VL (flange width), VM (flange height), VN (flange diameter), VO (flange thickness), VP (flange width), VQ (flange height), VR (flange diameter), VS (flange thickness), VT (flange width), VU (flange height), VV (flange diameter), VW (flange thickness), VX (flange width), VY (flange height), VZ (flange diameter), WA (flange width), WB (flange height), WC (flange diameter), WD (flange thickness), WE (flange width), WF (flange height), WG (flange diameter), WH (flange thickness), WI (flange width), WJ (flange height), WK (flange diameter), WL (flange thickness), WM (flange width), WN (flange height), WO (flange diameter), WP (flange thickness), WQ (flange width), WR (flange height), WS (flange diameter), WT (flange thickness), WU (flange width), WV (flange height), WW (flange diameter), WX (flange thickness), WY (flange width), WZ (flange height), XA (flange diameter), XB (flange thickness), XC (flange width), XD (flange height), XE (flange diameter), XF (flange thickness), XG (flange width), XH (flange height), XI (flange diameter), XJ (flange thickness), XK (flange width), XL (flange height), XM (flange diameter), XN (flange thickness), XO (flange width), XP (flange height), XQ (flange diameter), XR (flange thickness), XS (flange width), XT (flange height), XU (flange diameter), XV (flange thickness), XW (flange width), XX (flange height), XY (flange diameter), XZ (flange thickness), YA (flange height), YB (flange diameter), YC (flange thickness), YD (flange width), YE (flange height), YF (flange diameter), YG (flange thickness), YH (flange width), YI (flange height), YJ (flange diameter), YK (flange thickness), YL (flange width), YM (flange height), YN (flange diameter), YO (flange thickness), YP (flange width), YQ (flange height), YR (flange diameter), YS (flange thickness), YT (flange width), YU (flange height), YV (flange diameter), YW (flange thickness), YX (flange width), YY (flange height), YZ (flange diameter), ZA (flange width), ZB (flange height), ZC (flange diameter), ZD (flange thickness), ZE (flange width), ZF (flange height), ZG (flange diameter), ZH (flange thickness), ZI (flange width), ZJ (flange height), ZK (flange diameter), ZL (flange thickness), ZM (flange width), ZN (flange height), ZO (flange diameter), ZP (flange thickness), ZQ (flange width), ZR (flange height), ZS (flange diameter), ZT (flange thickness), ZU (flange width), ZV (flange height), ZW (flange diameter), ZX (flange thickness), ZY (flange width), ZZ (flange height)

NOTES :- 1) ALL DIMENSIONS ARE IN mm EXCEPT SPECIFIED
2) DO NOT SCALE THE DRAWING



10.4 (Unit 3 & 4 - Q, N type Impeller iNS)

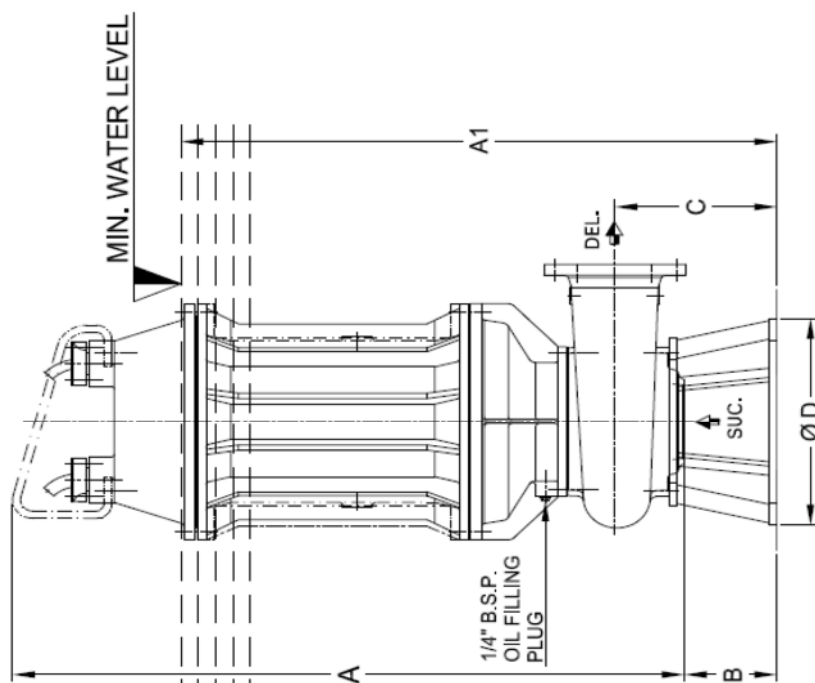
KIRLOSKAR BROTHERS LIMITED



GENERAL DIMENSIONS TRANSPORTABLE INSTALLATION III

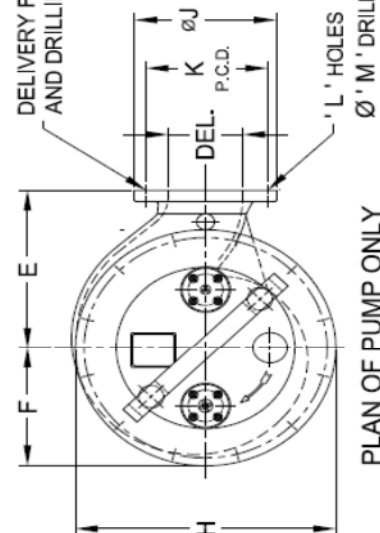
SR. NO.	PUMP TYPE	SUCTION & DELIVERY NOMINAL SIZE		A	B	C	D	E	F	H	J DIA.	K P.C.D.	L M	A1
		NWS	NWD											
01	NS 80 / 40	100	80	1305	165	265	550	350	265	530	200	160	8 18	1100
02	NS 100 / 32	125	100	1325	170	290	500	310	265	530	220	180	8 18	1130
03	NS 100 / 40	125	100	1335	170	290	500	350	265	530	220	180	8 18	1135
04	NS 150 / 26	150	150	1355	185	325	460	350	265	530	285	240	8 23	1170
05	NS 150 / 32	150	150	1350	190	325	500	395	265	530	285	240	8 23	1170
06	NS 150 / 40	150	150	1355	190	325	600	395	280	560	285	240	8 23	1170
07	NS 200 / 32	200	200	1360	215	360	500	395	275	550	340	295	12 23	1200
08	NS 200 / 40	200	200	1375	205	360	650	395	325	560	340	295	12 23	1200

NOTES :- 1) ALL DIMENSIONS ARE IN mm EXCEPT SPECIFIED
2) DO NOT SCALE THE DRAWING



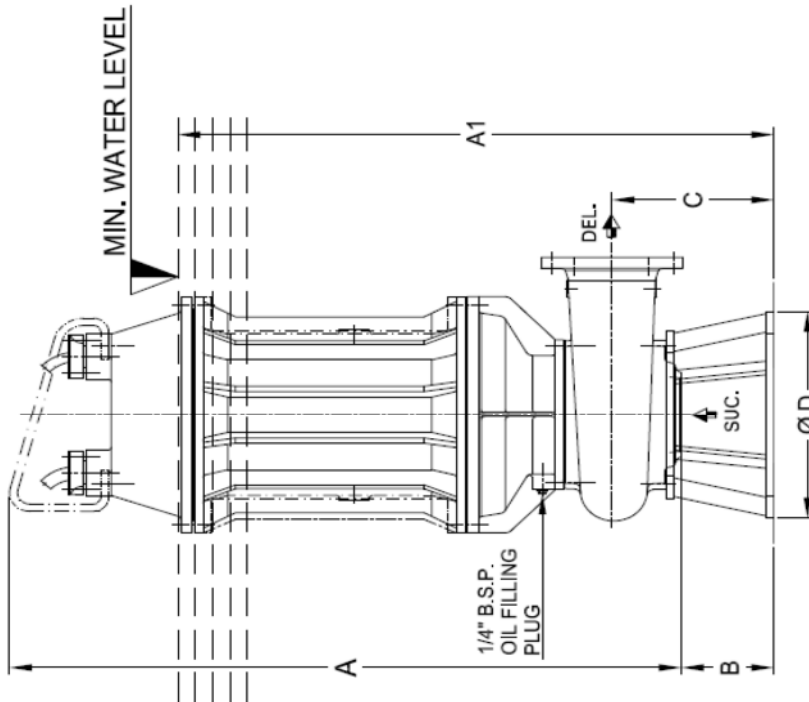
Side elevation view of the transportable installation. Dimensions shown include: A (total width), A1 (width to delivery flange), B (width to suction flange), C (width to delivery flange), DEL. (delivery flange), SUC. (suction flange), Ø D (diameter), and MIN. WATER LEVEL (indicated by a dashed line).

DELIVERY FLANGE WITH PLAIN FACE
AND DRILLING AS PER IS:6392 - TABLE 15

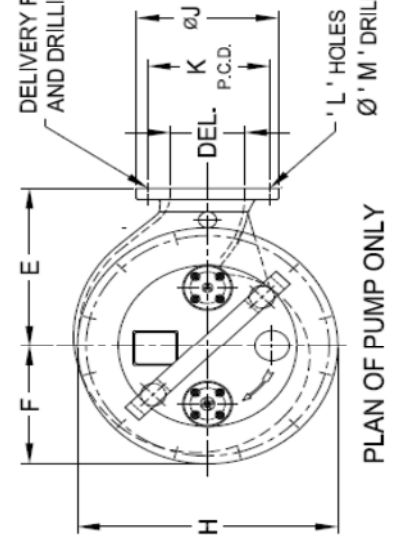


Plan view of the pump. Dimensions shown include: E (height to delivery flange), F (height to suction flange), H (height to base), Ø J (diameter of delivery flange), K (P.C.D. of delivery flange), DEL. (delivery flange), and 'L' HOLES Ø 'M' DRILL THRO. (indicated by a dashed line).

PLAN OF PUMP ONLY



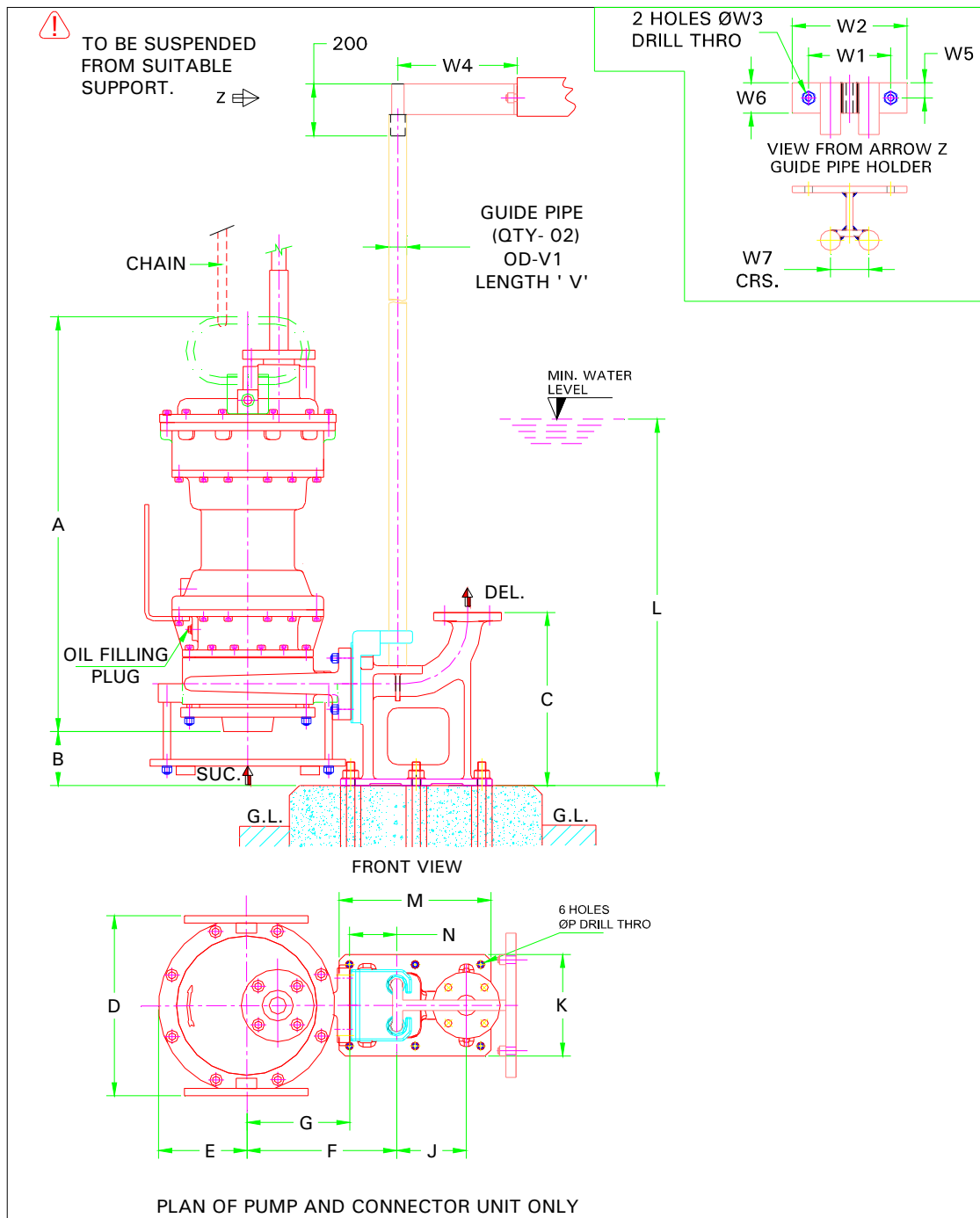
DELIVERY FLANGE WITH PLAIN FACE
AND DRILLING AS PER IS:6392 - TABLE 15



NOTES :- 1) ALL DIMENSIONS ARE IN mm EXCEPT SPECIFIED
2) DO NOT SCALE THE DRAWING

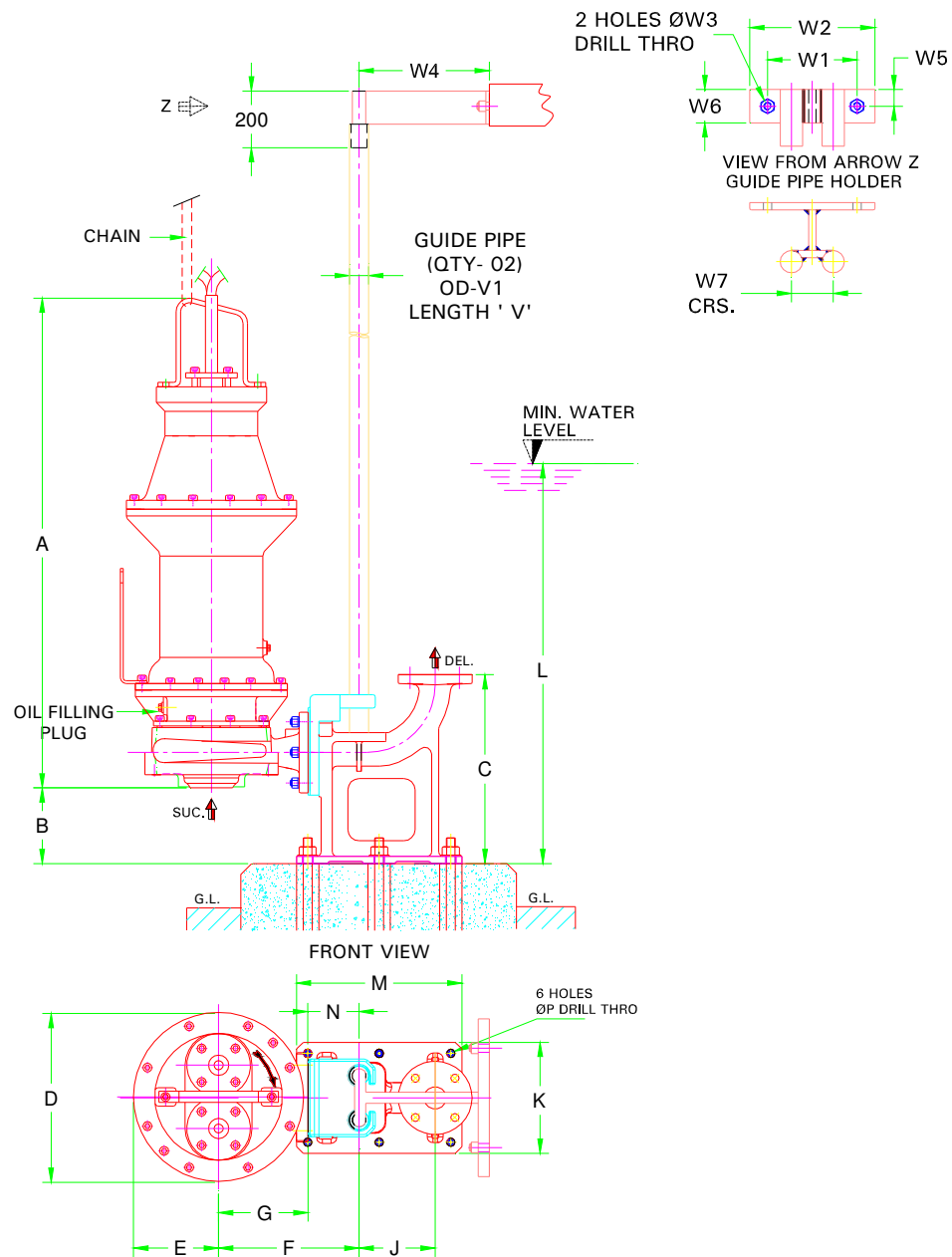
11 GENERAL ARRANGEMENT DRAWING & DIMENSIONS SHEET

11.1 For iNS QT type model unit 1 & 2



Pump	UNIT	A	B	C	D	E	F	G	J	K	L	M	N	P	Q1	Q2	R1	R2	R3	S	T1	T2	U	V1	W1	W2	W3	W4	W5
NS20/13QT	1	580	80	250	285	143	254	150	110	200	450	300	105	19	150	400	125	250	500	100	100	50	250	43	150	200	23	200	38
NS20/13QT	2	625	80	250	285	143	254	150	110	200	500	300	20	19	150	400	125	250	500	100	100	50	250	43	150	200	23	200	38
NS32/13QT	2	762	80	290	285	143	254	150	150	210	500	340	40	19	160	410	145	290	540	100	100	50	250	43	150	200	23	200	38
NS40/13QT	2	610	130	350	285	143	264	150	170	250	550	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38

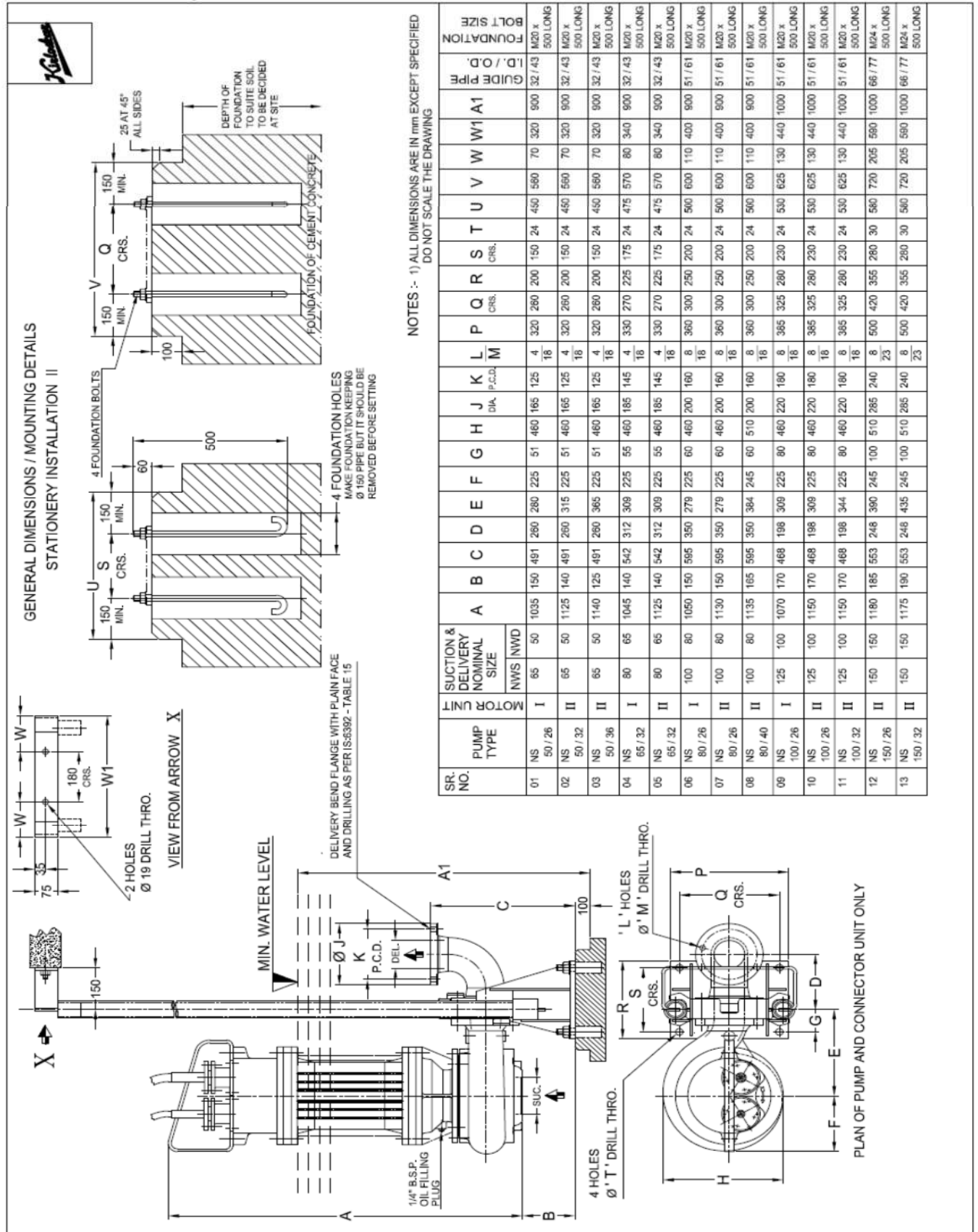
11.2 For iNS N, Q type model unit 3,4,5,6



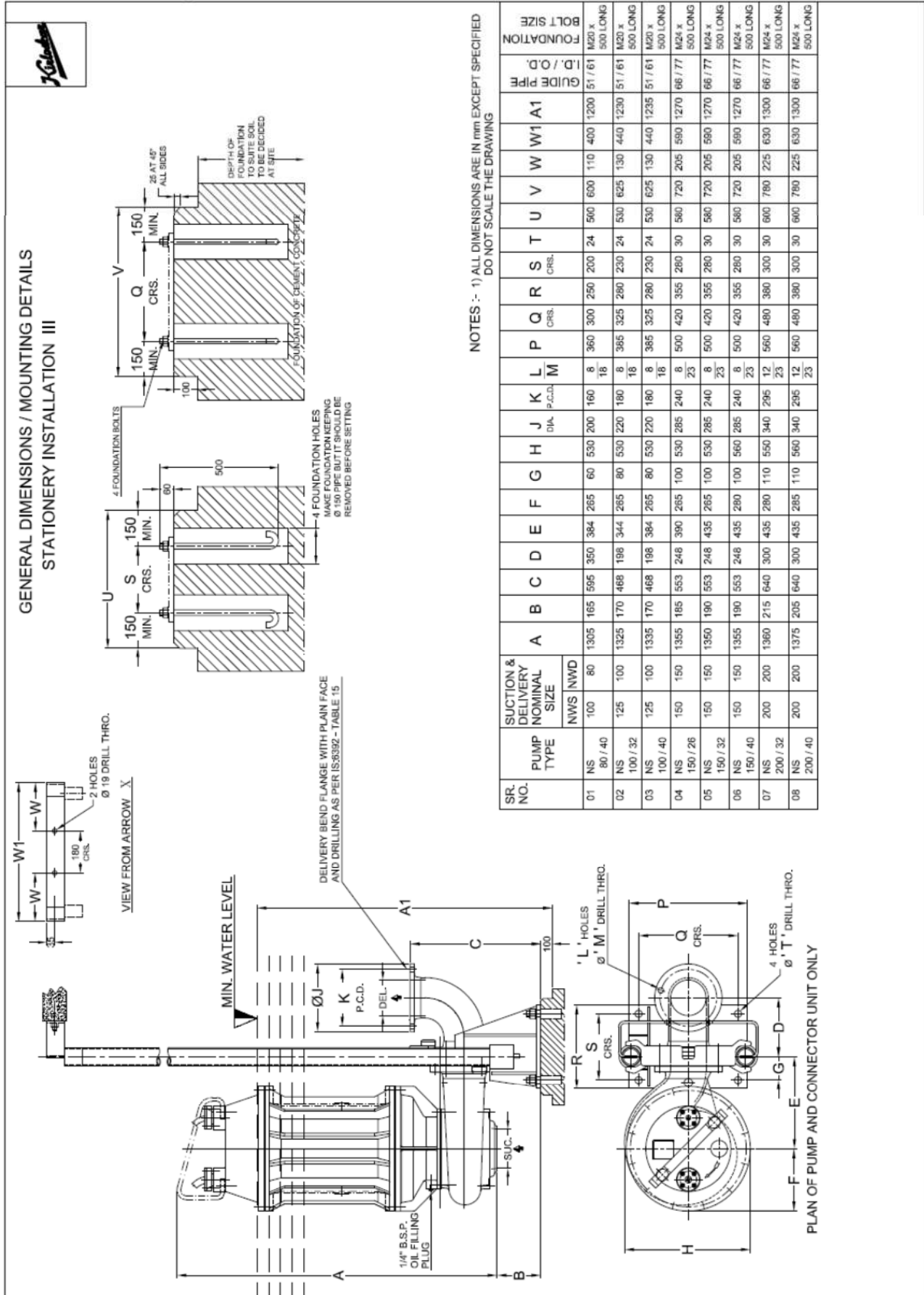
PLAN OF PUMP AND CONNECTOR UNIT ONLY

Pump	UNIT	A	B	C	D	E	F	G	J	K	L	M	N	P	Q1	Q2	R1	R2	R3	S	T1	T2	U	V1	W1	W2	W3	W4	W5	W6	W7	BS	LEN
NS100/26QM	4	1105	175	468	450	225	399	275	210	320	800	540	170	19	220	470	220	440	690	100	100	50	250	43	200	300	23	200	50	100	140	16	250
NS100/26QM	5	1215	175	468	450	225	399	275	210	320	900	540	170	19	220	470	220	440	690	100	100	50	250	43	200	300	23	200	50	100	140	16	250
NS100/26QM	6	1240	175	468	450	225	399	275	210	320	900	540	170	19	220	470	220	440	690	100	100	50	250	43	200	300	23	200	50	100	140	16	250
NS100/26QT	4	1105	175	468	450	225	399	275	210	320	800	540	170	19	220	470	220	440	690	100	100	50	250	43	200	300	23	200	50	100	140	16	250
NS100/26QT	5	1215	175	468	450	225	399	275	210	320	900	540	170	19	220	470	220	440	690	100	100	50	250	43	200	300	23	200	50	100	140	16	250
NS100/26QT	6	1240	175	468	450	225	399	275	210	320	900	540	170	19	220	470	220	440	690	100	100	50	250	43	200	300	23	200	50	100	140	16	250
NS100/32QM	5	1210	180	468	490	245	434	310	210	320	900	540	170	19	220	470	220	440	690	100	100	50	250	43	200	300	23	200	50	100	140	16	250
NS100/32QM	6	1235	180	468	490	245	434	310	210	320	900	540	170	19	220	470	220	440	690	100	100	50	250	43	200	300	23	200	50	100	140	16	250
NS100/32QT	5	1210	180	468	490	245	434	310	210	320	900	540	170	19	220	470	220	440	690	100	100	50	250	43	200	300	23	200	50	100	140	16	250
NS100/32QT	6	1235	180	468	490	245	434	310	210	320	900	540	170	19	220	470	220	440	690	100	100	50	250	43	200	300	23	200	50	100	140	16	250
NS150/26QM	4	1150	175	553	475	238	480	350	260	390	850	560	165	6	340	640	225	450	750	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QM	5	1240	130	553	450	225	474	350	260	390	900	560	165	19	340	590	255	510	760	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QM	6	1295	130	553	450	225	474	350	260	390	900	560	165	19	340	590	255	510	760	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QMB	4	1150	175	553	475	238	480	350	260	390	850	560	165	6	340	640	225	450	750	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QMB	5	1240	130	553	450	225	474	350	260	390	900	560	165	19	340	590	255	510	760	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QMB	6	1295	130	553	450	225	474	350	260	390	900	560	165	19	340	590	255	510	760	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QNM	4	1150	175	553	475	238	480	350	260	390	850	560	165	6	340	640	225	450	750	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QNM	5	1240	130	553	450	225	474	350	260	390	900	560	165	19	340	590	255	510	760	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QNM	6	1295	130	553	450	225	474	350	260	390	900	560	165	19	340	590	255	510	760	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QT	4	1150	175	553	475	238	480	350	260	390	850	560	165	6	340	640	225	450	750	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QT	5	1240	130	553	450	225	474	350	260	390	900	560	165	19	340	590	255	510	760	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/26QT	6	1295	130	553	450	225	474	350	260	390	900	560	165	19	340	590	255	510	760	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS150/32QM	6	1260	165	553	490	245	519	395	260	390	900	560	165	19	340	590	255	510	760	100	100	50	250	43	200	300	23	200	38	75	140	16	250
NS20/16QT	3	910	82	250	340	170	284	180	110	200	500	300	105	19	150	400	125	250	500	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS20/16QT	4	1005	82	250	340	170	284	180	110	200	600	300	105	19	150	400	125	250	500	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS20/20QT	3	920	81	250	355	178	284	180	110	200	550	300	105	19	150	400	125	250	500	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS20/20QT	4	1015	81	250	355	178	284	180	110	200	600	300	105	19	150	400	125	250	500	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS20/20QT	5	1105	81	250	405	203	284	180	110	200	700	300	105	19	150	400	125	250	500	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS32/13QT	3	915	82	290	340	170	254	150	150	210	650	340	40	19	160	410	145	290	540	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS32/16QT	3	940	55	290	340	170	284	180	150	210	550	340	40	19	160	410	145	290	540	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS32/16QT	4	1035	55	290	340	170	284	180	150	210	600	340	40	19	160	410	145	290	540	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/13QT	3	915	130	350	340	170	264	150	170	250	650	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/13QT	4	1010	130	350	340	170	264	150	170	250	650	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/16QT	3	940	105	350	340	170	304	190	170	250	600	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/16QT	4	1035	105	350	340	170	304	190	170	250	700	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/16QT	5	1125	105	350	405	203	304	190	170	250	800	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/20QT	3	932	125	350	380	190	314	200	170	250	600	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/20QT	4a	1025	125	350	380	190	314	200	170	250	600	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/20QT	5	1100	125	350	405	203	314	200	170	250	700	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/32QT	3	960	98	350	495	248	389	275	170	250	600	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/32QT	4	1055	98	350	495	248	389	275	170	250	700	370	115	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS40/32QT	4a	1055	160	490	450	225	369	245	220	270	750	480	140	19	220	470	205	410	660	100	100	50	250	43	200	250	23	200	50	100	140	16	250
NS50/13QT	3	950	150	425	340	170	270	180	170	250	650	370	25	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS50/13QT	4	1130	150	425	405	203	270	180	170	250	750	370	25	19	200	450	160	320	570	100	100	50	250	43	150	200	23	200	38	75	100	16	250
NS50/16QT	4	1003	188	425	340	170	290	200	170	250	700	370	25	19																			

11.3 NS stationary installation unit 1 & 2

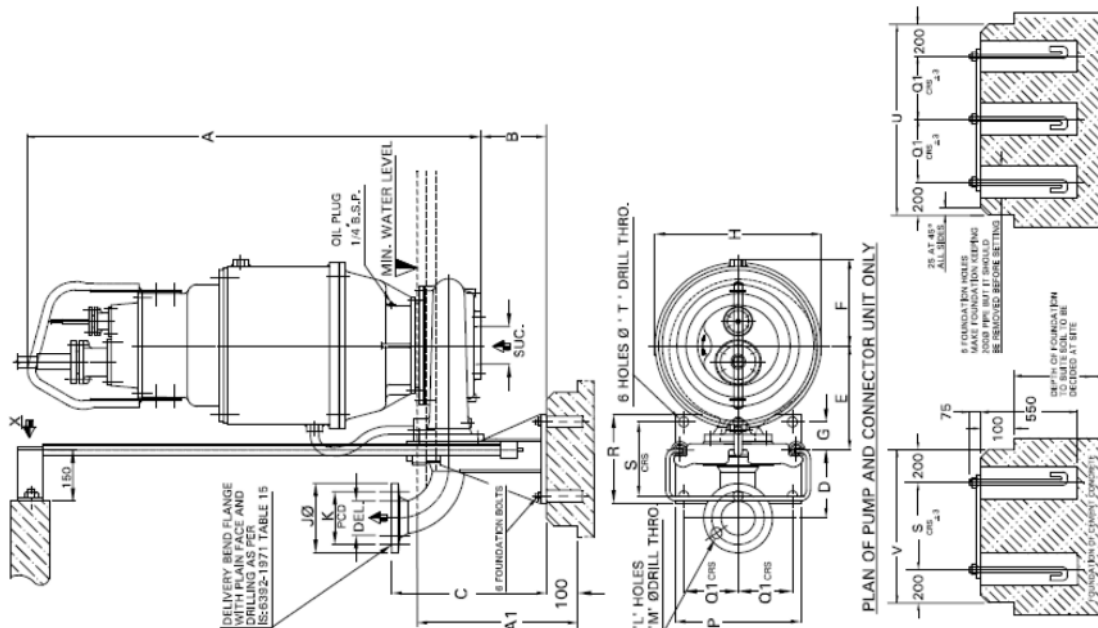


11.4 NS stationary installation unit 3 & 4



11.5 NS stationary installation unit 5 & Above

GENERAL DIMENSIONS STATIONARY INSTALLATION IV, V & VI



SR. No.	PUMP TYPE	MOTOR UNIT	SUC. AND DEL. SIZE		A	B	C	D	E	F	G	H	J	K	L	M	P	Q1	R	S	T	U	V	W	W1	A1	GUIDE PIPE I.D. Ø	FOUNDATION BOLT SIZE
			NOMINAL SIZE	NWS NWD																								
01	NS 100/40	IV	125	100	1600	170	468	188	384	350	80	660	220	180	8/18	550	225	360	280	30	850	680	130	440	500	51	61	M27 x 500 LONG
02	NS 100/40	V	125	100	1710	170	468	188	384	350	80	660	220	180	8/18	550	225	360	280	30	850	680	130	440	500	51	61	M27 x 500 LONG
03	NS 150/40	IV	150	150	1825	190	553	248	435	350	135	660	285	240	8/23	650	275	450	350	30	950	750	205	590	600	66	77	M27 x 500 LONG
04	NS 150/40	V	150	150	1965	190	553	248	435	350	135	660	285	240	8/23	650	275	450	350	30	950	750	205	590	600	66	77	M27 x 500 LONG
05	NS 150/40	VI	150	150	2055	190	553	248	435	350	135	660	285	240	8/23	650	275	450	350	30	950	750	205	590	600	66	77	M27 x 500 LONG
06	NS 150/50	V	150	150	2335	170	553	248	490	365	135	685	285	240	8/23	650	275	450	350	30	950	750	205	590	600	66	77	M27 x 500 LONG
07	NS 150/50	VI	150	150	2445	170	553	248	490	420	135	790	285	240	8/23	650	275	450	350	30	950	750	205	590	600	66	77	M27 x 500 LONG
08	NS 200/40	IV	200	200	1995	195	640	300	435	350	110	660	340	295	12/23	850	285	430	350	30	950	750	225	630	800	66	77	M27 x 500 LONG
08	NS 200/40	V	200	200	2190	195	640	300	435	365	110	660	340	295	12/23	850	285	430	350	30	950	750	225	630	800	66	77	M27 x 500 LONG
10	NS 200/40	VI	200	200	2250	195	640	300	435	420	110	790	340	295	12/23	850	285	430	350	30	950	750	225	630	800	66	77	M27 x 500 LONG
11	NS 250/40	IV	250	250	1950	342	800	375	505	350	135	690	405	355	12/26	800	350	500	400	33	1100	800	210	820	800	78	89	M30 x 500 LONG
12	NS 250/40	V	250	250	2080	342	800	375	505	365	135	695	405	355	12/26	800	350	500	400	33	1100	800	210	820	800	78	89	M30 x 500 LONG
13	NS 250/40	VI	250	250	2140	342	800	375	505	420	135	790	405	355	12/26	800	350	500	400	33	1100	800	210	820	800	78	89	M30 x 500 LONG
14	NS 250/50	V	250	250	2185	330	800	375	655	370	135	790	405	355	12/26	800	350	500	400	33	1100	800	210	820	800	78	89	M30 x 500 LONG
15	NS 250/50	VI	250	250	2305	330	800	375	655	420	135	840	405	355	12/26	800	350	500	400	33	1100	800	210	820	800	78	89	M30 x 500 LONG
16	NS 250/50	VII	250	250	2390	330	800	375	655	480	135	860	405	355	12/26	800	350	500	400	33	1100	800	210	820	800	78	89	M30 x 500 LONG
17	NS 300/55	V	300	300	2185	370	881	406	655	370	175	790	480	410	12/26	850	375	650	550	33	1150	950	250	900	800	90	102	M30 x 500 LONG
18	NS 300/55	VI	300	300	2285	370	881	406	655	420	175	860	480	410	12/26	850	375	650	550	33	1150	950	250	900	800	90	102	M30 x 500 LONG
19	NS 300/55	VII	300	300	2390	370	881	406	655	480	175	860	480	410	12/26	850	375	650	550	33	1150	950	250	900	800	90	102	M30 x 500 LONG

* FOR SR. No. 14 TO 19

THE CIVIL ENGINEERING DETAILS SHOWN IN THIS DRAWING ARE TENTATIVE AND THOSE SHOULD BE DECIDED AND FINALISED AT CUSTOMER'S END PLEASE NOTE

As we are constantly endeavoring to improve the performance our products/ equipment, we reserve the right to make alterations from time to time and as such our products/ equipment may differ from that detailed in this publication. For latest information, you may get in touch with our Regional Sales Office.

12 ANNEXURE: CONTROL PANEL SPECIFICATIONS

KBL insists NS pumps to be started with control panel equipped with below mentioned protecting features. KBL will not be responsible for failure of pumps if control panel is not used.

Control panel shall consist of following.

1. Starter: Direct on line (DOL); Star delta starting (SDS)
2. Switch: Three phase with neutral switch
3. Fuse: High rupturing capacity fuses (HRC)
4. Safety features:
 - a) Tripping of motor in case of single phasing and Reverse phasing.
 - b) Moisture sensing circuit for detecting ingress of moisture or water into oil of the oil chamber and tripping of motor in case of contamination of oil.
 - c) Tripping of motor by detecting High winding temperature with the help of Thermister relay.
 - d) Liquid level controllers with probes of High & Low levels to avoid dry running of the pump.
 - e) Thermal Overload Relay for overload protection.
5. Automatic operation of pump on Liquid level controllers.
6. Mountings on front door of the control panel.
 - a. Analog Ammeter for Current display
 - b. LED for indications of following.
 - i) Oil contamination.
 - ii) low liquid level.
 - iii) High temperature of the motor winding.
 - iv) Low/High Voltage / Rev. Phasing / single phasing.
 - v) Over loading of motor.
 - vi) Pump On.
 - c. Push buttons for Start, Stop and Reset for Moisture Contamination
 - d. Auto / Off / Manual selector switch

B) Control panel shall be equipped with fully automatic starters designed to operate pump motors of following specifications.

Voltage:	415 V $\pm$ 10 %
Frequency:	50 Hertz $\pm$ 5 %
Phase:	3 Phases + Neutral
Class of duty:	Continuous
Class of insulation:	F with temperature rise limit to class B

Panel ingress Protection: IP54

*Special panels available against request

MOTOR PROTECTION UNIT

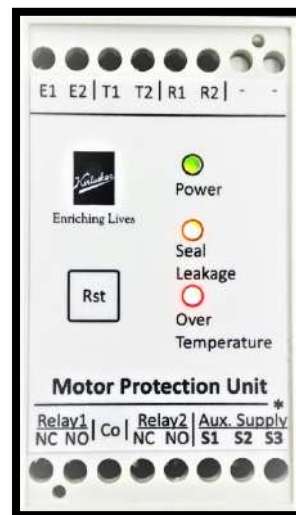
MPU Will be supplied to suite the thermistor and moisture sensor in the pump. Vendor can mount this unit on their local starter control panel.

Features of MPU:

- Protects pump motor against moisture in case of seal failure
- Protects pump motor winding by detecting High winding Temperature
- Din Rail Mounted compact unit can be placed in starter panel
- Easy Interfacing with starter panels
- LED indications for Moisture & High winding temperature.

Sr.	Particulars	Specifications
1	Enclosure	ABS
2	Mounting	Standard Din Rail
3	Terminations	Screw Type
4	Sensor Inputs	Moisture & PTC
5	Indications	LED, Moisture & High Winding Temperature
6	Outputs	Potential Free Relays for Tripping, Moisture & High winding Temperature Faults
7	Main Supply	230 VAC, 50 Hz

Technical Specifications and its detailed view.



13. SPARE PARTS

A set of ball bearings, a set of casing rings must always be kept at hand to ensure uninterrupted service from the pump while ordering for spare parts, always give type, size and serial number of the pumps as stamped on the name plate.

14. ENVIRONMENTAL ASPECTS:

Our products are designed and manufactured considering all environmental aspects to minimize impact on the environment. We ensure that the product supplied by us utilizes less energy during their life cycle and it does not emit any hazardous gas or cause any harm to any living being or to the environment. User of this product is recommended to follow the operating instructions and maintain the product in periodic manner, in order to ensure that it always functions with optimum energy efficiency.

Product Recycle Program

As a commitment towards a greener future, conservation of natural resources and reduction of carbon foot print, Kirloskar Brothers Limited offers to take back/replace its used products once it has reached the end-of-life and ensure that it is recycled/ disposed in an environment friendly manner with the following objective.

- To facilitate our customers for recycling / safe disposal of 'end-of-life' product in environment friendly through a recycle program.
- To minimize the impact caused by product disposal on society / environment.
- To reuse the recyclable components as secondary source of raw material.
- To ensure implementation of control mechanism over third part for recycle/safe disposal of the waste generated.
- To offer or replace customer's existing product with more efficient and environment friendly product.

End of life of Kirloskar Brothers Limited product shall be considered, when a customer has declared that the product has become redundant (the product has become obsolete/unfit for use/non-functional and cannot be refurbished in consultation with Kirloskar Brothers Limited personnel) Or the customer wishes to replace the existing product for a shift in technology/for replacement of product by latest/advanced technology of more energy efficient friendly product. As the product reaches its End-of-Life, the customer shall communicate the same through the Kirloskar Brothers Limited mail ID, customercare.recycle@kbl.co.in or approach the nearest Customer Support Service/Regional Offices/ Authorized Dealer/Authorized Service Dealers who in turn shall communicate the same to Zonal Customer Support Service representative.