

TRAINING OPERATOR PROYEK ANDIR

2022

April, 2021



Type pompa pengendali banjir

Type Pompa

Axial Submersible motor Pump
(Andir, Cijambe Barat)
Nama Pompa : KSB AMACAN

Centrifugal Submersible motor Pump
(Cisangkui, Cipalasari 1,Cipalasari 2)
Nama Pompa : KSB Amarex KRTK



Foto Nameplate pompa

Dikirimkan oleh operator ke KSB sebagai informasi awal Ketika terjadi kerusakan (970.01 , 970.02)

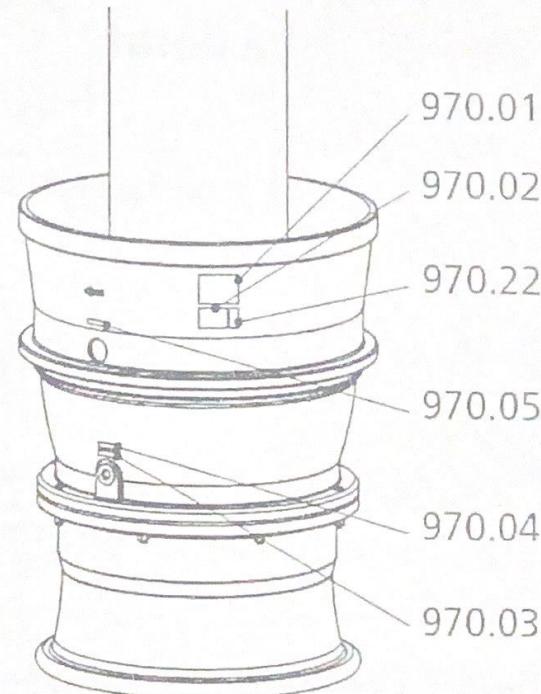


Name plate

| | |
|----|---|
| a) | <p>4 KSB b) KSB Axistangentialpumpe 47271 front radial</p> <p>TYPE: Aximix PA4 600-310-424U001 No. 5970818252/001010</p> <p>Q 1000 l/h m³/h 11.4 m 2011</p> <p>TEMP. MAX. 40 °C 560 kg</p> <p>MOTOR IP 68 SUBM. MAX. 30 min CLASS H</p> <p>DIAHUB S-40 3 - M-RED 122456</p> <p>P_n 400 V 50Hz 0.80 kW 0.80 kg</p> <p>1400 min⁻¹ 82 A 1400 S.4 51</p> <p>DISCLAIMER: RECHT AUF TÄTIGKEITEN DURCH + WARNING: DO NOT OPERATE UNLESS ENDED + ACHTUNG: NICHT AUF TÄTIGKEITEN DURCH + DISCLAIMER: RECHT AUF TÄTIGKEITEN DURCH + WARNING: DO NOT OPERATE UNLESS ENDED + ACHTUNG: NICHT AUF TÄTIGKEITEN DURCH</p> <p>Mod. No. 01093274 DR 1426 M 24</p> |
| b) | <p>+ KSB b) KSB Axistangentialpumpe 67271 front radial</p> <p>TYPE: Aximix PA4 600-310-424U001 No. 5970818252/001010</p> <p>Q 1000 l/h m³/h 11.4 m 2011</p> <p>TEMP. MAX. 40 °C 560 kg</p> <p>MOTOR IP 68 SUBM. MAX. 30 min CLASS H</p> <p>DIAHUB S-40 3 - M-RED 122456</p> <p>40 kW 400 V 50Hz 0.80 kW 0.80 kg</p> <p>1400 min⁻¹ 82 A 1400 S.4 51</p> <p>DISCLAIMER: RECHT AUF TÄTIGKEITEN DURCH + WARNING: DO NOT OPERATE UNLESS ENDED + ACHTUNG: NICHT AUF TÄTIGKEITEN DURCH + DISCLAIMER: RECHT AUF TÄTIGKEITEN DURCH + WARNING: DO NOT OPERATE UNLESS ENDED + ACHTUNG: NICHT AUF TÄTIGKEITEN DURCH</p> <p>Mod. No. 01093274 DR 1426 M 24</p> |

Name plate (example) a) Standard pump set b) Explosion-proof pump set

| | | | |
|----|--|-----|---------------------------------------|
| 1 | Designation | 12 | IK36 order number |
| 3 | Flow rate | 14 | Maximum fluid and ambient temperature |
| 5 | Enclosure | 16 | Motor type |
| 7 | Rated power | 18 | Rated speed |
| 9 | Rated voltage | 19 | Rated current |
| 11 | Head | 12 | Year of construction |
| 13 | Total weight | 14 | Maximum submergence |
| 15 | Thermal class of winding insulation | 16 | Motor number |
| 17 | Power factor at design point | 18 | Rated frequency |
| 19 | Mode of operation | 19 | Starting current ratio |
| 21 | ATEX marking for the submersible motor | 122 | ATEX marking for the pump set |



Signs and plates on the pump

Perbandingan Axial dan Centrifugal

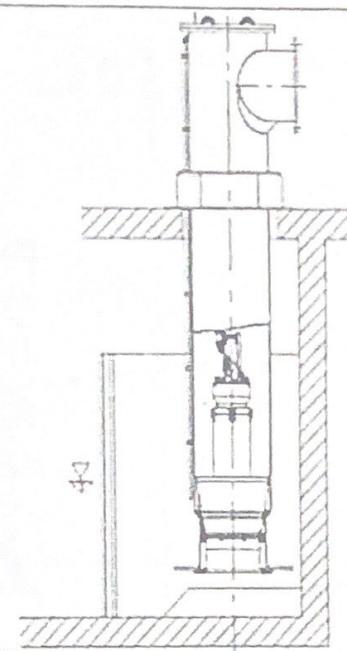
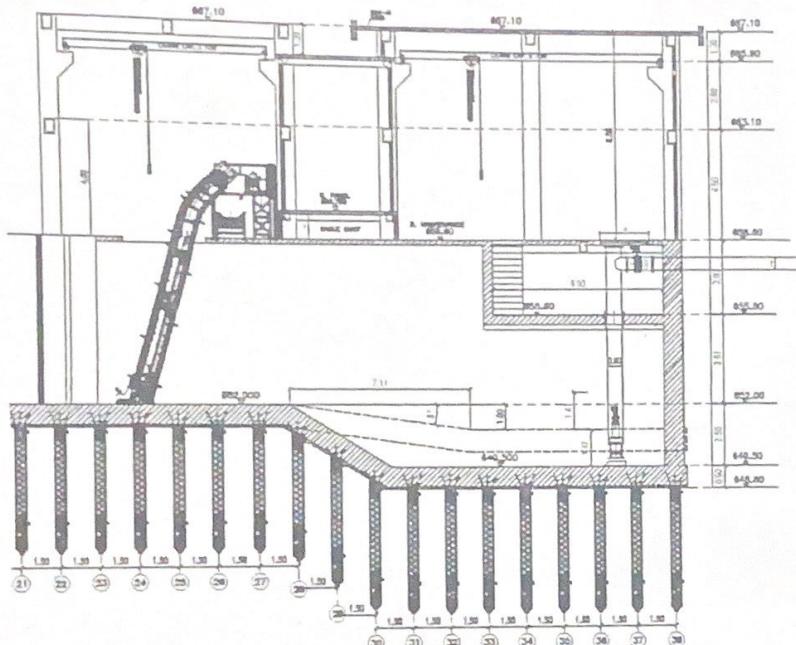
Andir, Cijambe barat

- Motor tercelup
- Memiliki sensor proteksi yang sama
- Ekonomis untuk kapasitas \geq 500 lps
- Banjir semakin tinggi, kapasitas pompa naik, Ampere turun ,Power turun
- Banjir semakin surut,kapasitas turun , Ampere naik, Power naik

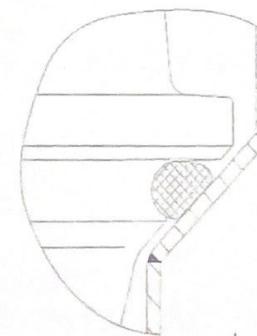
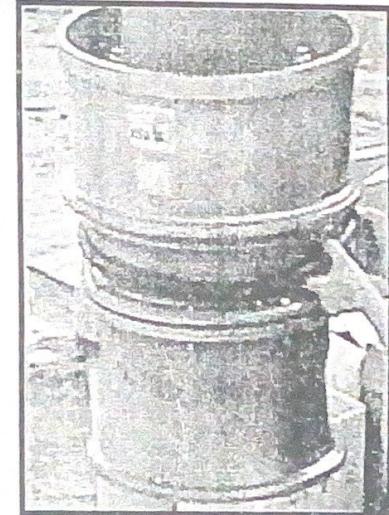
Cisangkuy, Cipanasari 1-2

- Ekonomis untuk kapasitas \leq 250 lps
- Banjir semakin tinggi, kapasitas pompa naik, ampere juga naik, Power naik
- Instalasi berbeda

Instalasi Pompa di Rumah Pompa Andir, Cijambe Barat

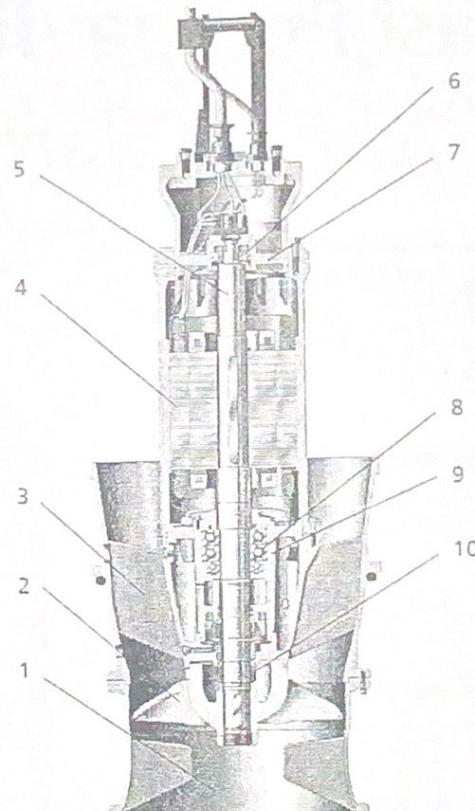
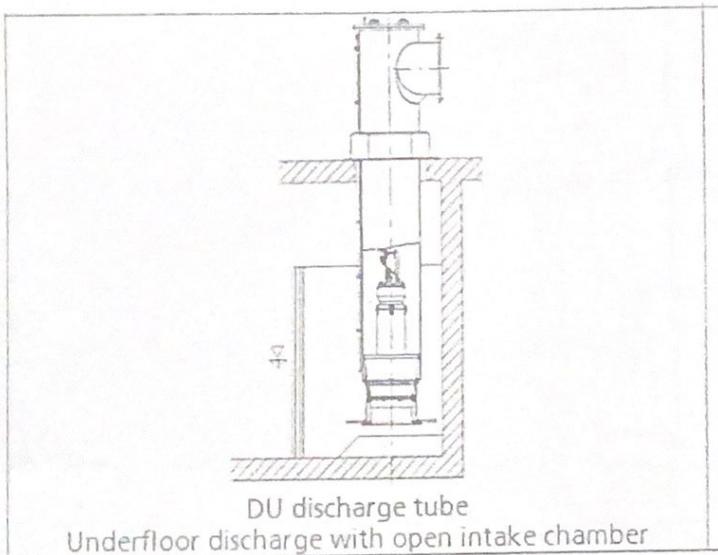


DU discharge tube
discharge with open intake c



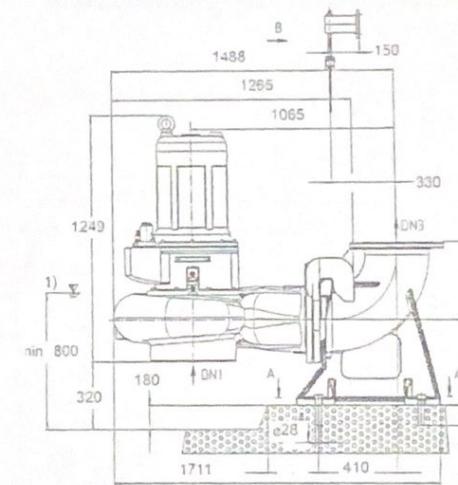
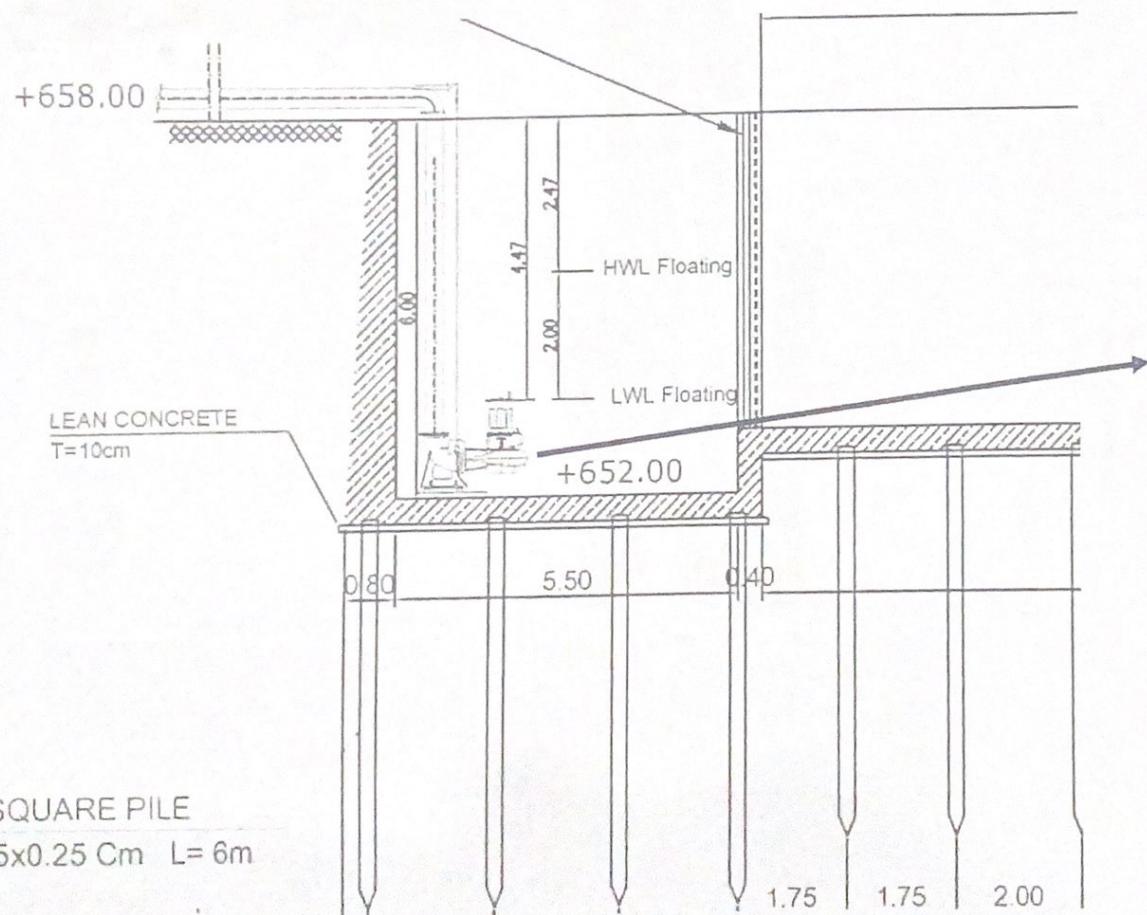
OPERATION & MAINTENANCE KSB AMACAN PUMP

Bagian-bagian Pompa

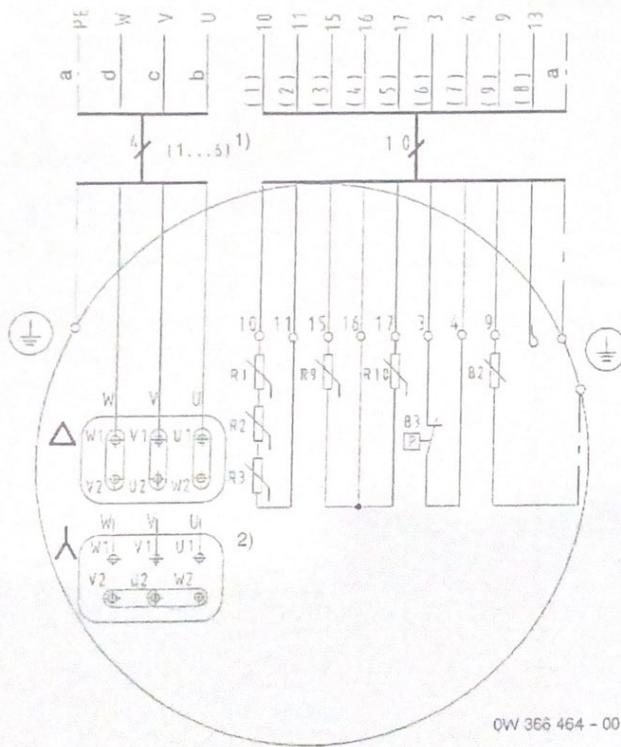


| | | | |
|---|----------------------------|----|--------------------|
| 1 | Suction nozzle (bellmouth) | 2 | Impeller |
| 3 | Diffuser casing | 4 | Electric motor |
| 5 | Shaft | 6 | Bearing, motor end |
| 7 | Bearing housing, motor end | 8 | Bearing, pump end |
| 9 | Bearing housing, pump end | 10 | Shaft seal |

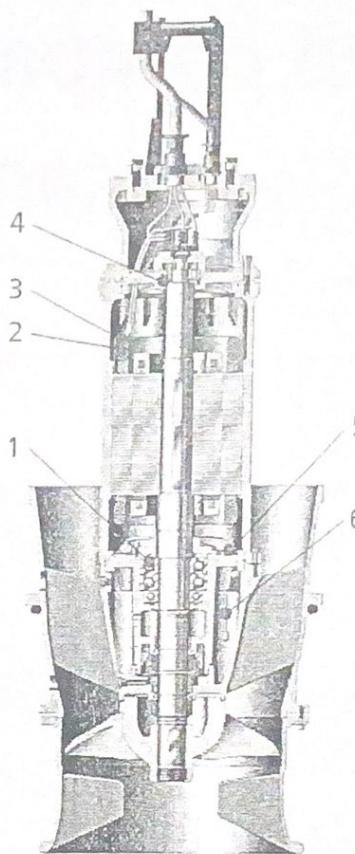
Rumah pompa Cipalasari 1-2, Cisangkuy



Sensor Proteksi



- Tidak Semua sensor terpasang (opsional)



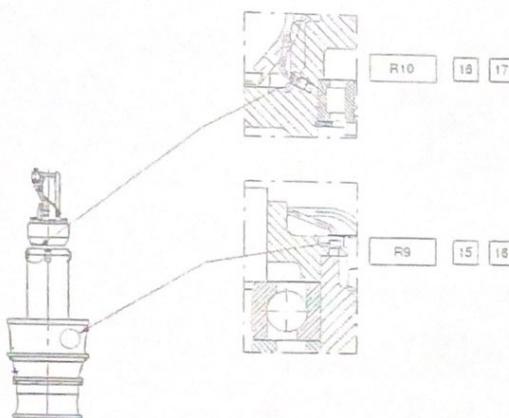
| Position | Sensor |
|----------|--------------------------------------|
| 1 | Bearing temperature (lower bearings) |
| 2 | Motor temperature (PT100) |
| 3 | Motor temperature (PTC) |
| 4 | Bearing temperature (upper bearing) |
| 5 | Leakage inside the motor |
| 6 | Mechanical seal leakage |

OPERATION & MAINTENANCE KSB AMACAN PUMP



Sensor Proteksi

Bearing temperature

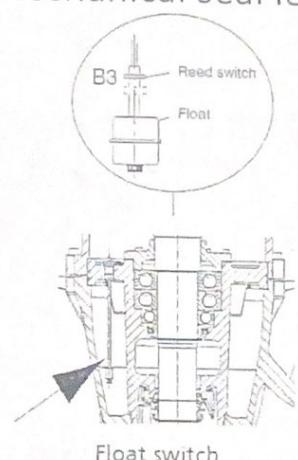


R9: PT 100-Thermal resistance in the pump-side bearing housing
Identification tapes: 15 16

R10: PT 100-Thermal resistance in the motor-side roller bearing housing
Identification tapes: 16 17

Warning temperature: 110 °C
Switch-off temperature: 130 °C

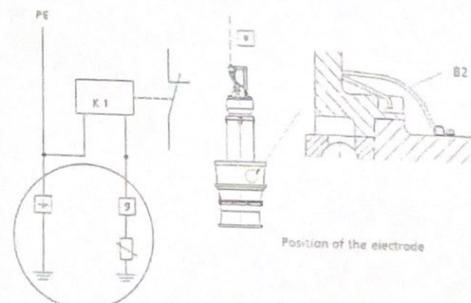
Mechanical seal leakage



B3 = Float switch (NC) in the leakage chamber
Identification tapes: 3 4

Kontak NC, akan terbuka
jika air masuk kedalam
leakage chamber karena
kerusakan mechanical seal

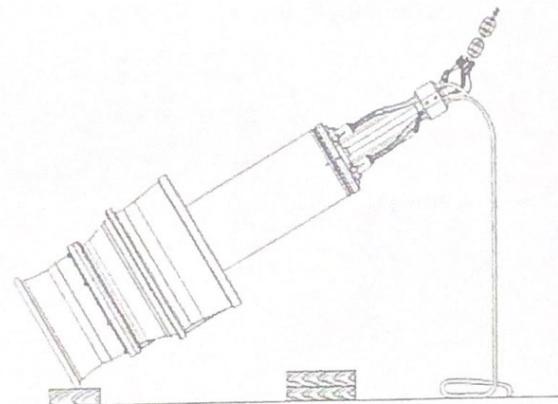
Leakage inside the motor



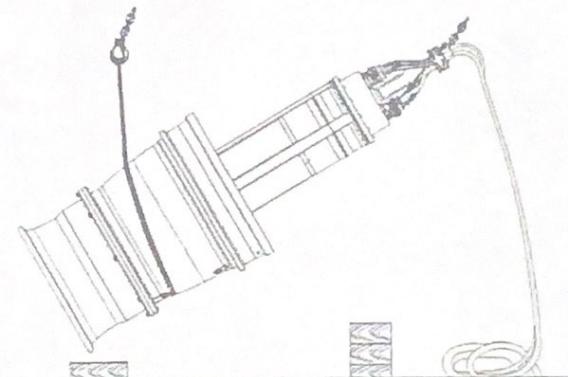
Original part KSB

OPERATION & MAINTENANCE
KSB AMACAN PUMP

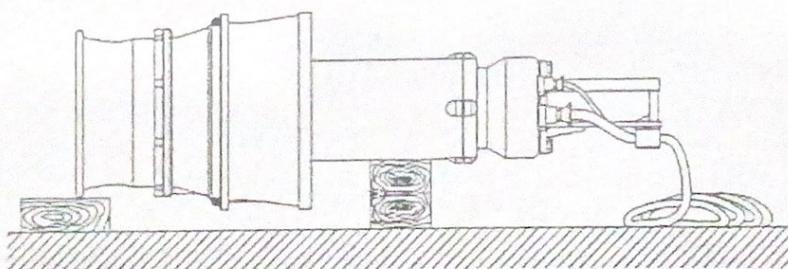
Pengangkatan Pompa



Mengangkat pompa dengan
1 crane



Mengangkat pompa dengan
2 crane



- Letakan pompa dengan posisi datar diatas **balok kayu**
- Pastikan **kabel** tidak terluka/tertiban/tertekuk
- Hati-hati, pompa menggelinding

OPERATION & MAINTENANCE KSB AMACAN PUMP



Service & Maintenance dilakukan 1 tahun sekali

Inspeksi Motor & Pompa

- Check konduktor ground

Ukur tahanan antara ground dan ground motor.

Nilai tahanan harus dibawah 1Ω .

- Ukur insulation resistance

Gunakan tegangan 500 V atau max 1000 V

Parameter yang diukur

- a) Windings motor dengan earth/ground
- b) Temperature sensors dan windings dengan earth/ground

**OPERATION & MAINTENANCE
KSB AMACAN PUMP**

Service & Maintenance

Maintenance Interval

Setiap 4.000 Jam atau satu tahun sekali

Setiap 8.000 jam atau tiga tahun sekali

Setiap 16.000 jam atau lima tahun sekali

Service/Maintenance

Check tahanan insulasi tiap kabel,
kabel-ground/bodi pompa
Check grounding

Check kondisi kabel
Check kondisi sensor
Check kebocoran mechanical seal
Check kondisi lubrikasi

General overhaul
Penggantian bearing, oli lubrikasi dan
mechanical seal

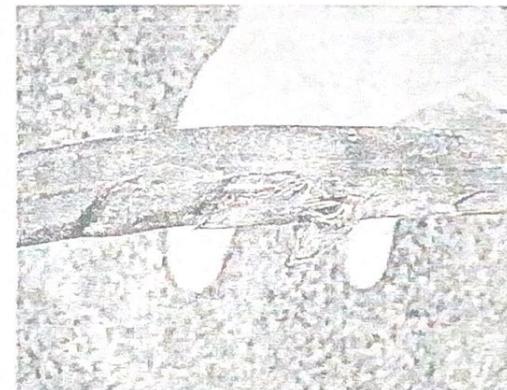
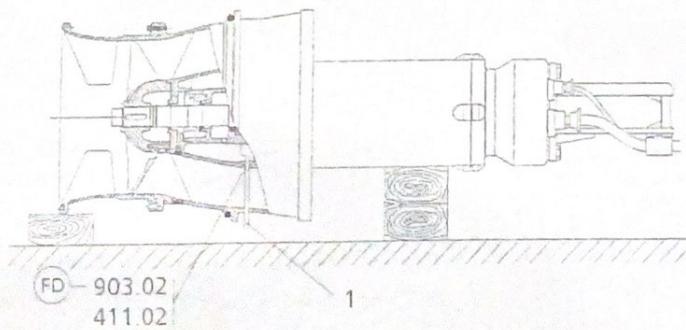
OPERATION & MAINTENANCE KSB AMACAN PUMP



Service & Maintenance

Inspeksi Motor & Pompa

- Check kabel power
 - Goresan
 - Luka
 - Kabel terkelupas
 - Kabel tertekuk
- Check Leakage chamber (Kebocoran)



- Buka screw plug 903.02
- Pasang Tube dengan thread G1/2
- Jika tidak keluar air (atau air keluar kurang dari 0.2 liter) berarti leakage chamber OK
- Tutup kembali screw plug dengan menggunakan sealeng (Hylomar SQ32M)

OPERATION & MAINTENANCE KSB AMACAN PUMP

Service & Maintenance

Inspeksi Motor & Pompa

- Check sensor proteksi

| Terminal | Sensor | Tahanan | |
|-----------|--------------------------|----------------|--|
| 10 dan 11 | Winding motor PTC | 200 – 1000 Ohm | Jika nilai tahanan melebihi, check kembali di terminal motor, jika masih lebih Everhoule |
| 31 dan 34 | Winding Motor PT100 | 100 – 120 Ohm | Jika nilai tahanan melebihi atau kurang, check kembali di terminal motor, jika masih lebih Everhoule |
| 9 dan PE | Leakage (Kebocoran) | > 60 K Ohm | Jika kurang dari 60 KΩ, Overhoule |
| 3 dan 4 | Float Switch (Kebocoran) | < 1 Ohm | |
| 15 dan 16 | Bearing Motor PT 100 | 100 -120 | Jika nilai tahanan melebihi atau kurang, check kembali di terminal motor, jika masih lebih Everhoule |
| 16 dan 17 | Bearing Motor PT 100 | 100-120 | Jika nilai tahanan melebihi atau kurang, check kembali di terminal motor, jika masih lebih Everhoule |

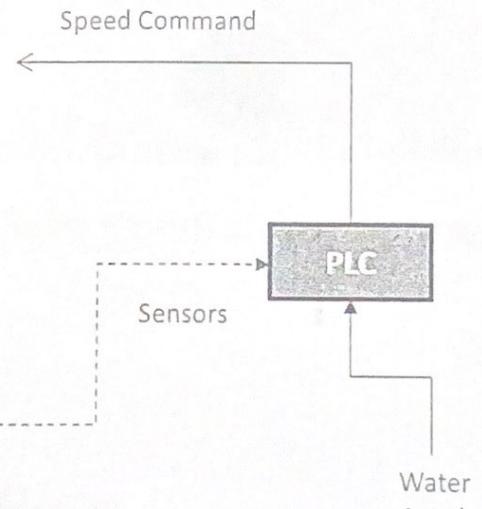
OPERATION & MAINTENANCE KSB AMACAN PUMP



Operation

R
S
T

Variable
Speed
Drive



Generator

Ganteng

- posisi auto. PLH

- Dila. Airin. mengelola. meski luncir.

- Cet. di setelah Ganteng. menyala. selama 12 jam.

- filter oilbar } 150. trans. ganti

- filter spotator } 100. tan. (apora. u/persiapan-

Pand-pamper.

Sejauh ini dia cet rpm.

DM. K160. MAX.

Temperatur. 31 - 32 Normal.