

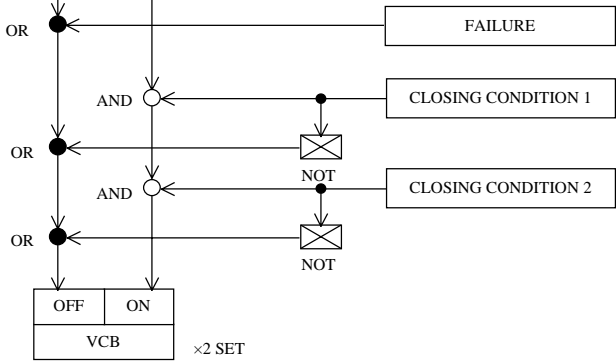
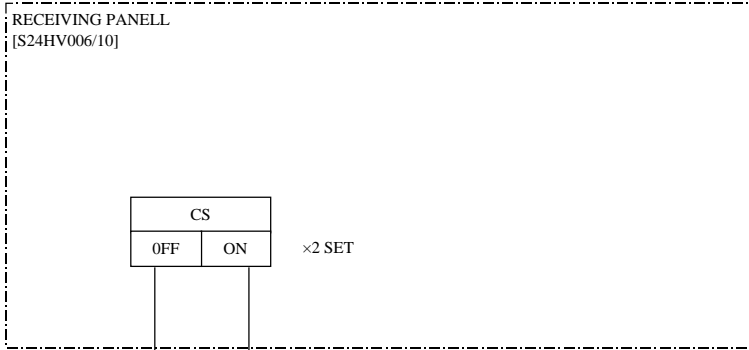
APPENDIX C ELECTRICAL OPERATION DIAGRAM

C.2 SEWERAGE FACILITIES

Abbreviation Table

| | |
|-----------|----------------------------|
| CS | Control Switch |
| COS | Change Over Switch |
| PBS | Push Button Switch |
| MCC | Motor Control Center |
| LOP | Local Operation Panel |
| LCD | Liquid Crystal Display |
| INP | Instrumentation Panel |
| MONI | Monitor |
| CRT | Cathode Ray Tube |
| PRN | Printer |
| VCB | Vacuum Circuit Breaker |
| SG | Switch-gear |
| INST. | Instrumentation |
| H.H. | High-high (Emergency High) |
| L.L. | Low-low (Emergency Low) |
| T (Alarm) | Trip |

| | | | | | |
|---------------|-------------|---------------------------|-----------------|----------|---|
| FACILITY NAME | | SLUDGE TREATMENT BUILDING | | | |
| TAG No. | S24HVP06/10 | EQUIPMENT NAME | RECEIVING PANEL | CAPACITY | - |
| DRIVE SYSTEM | | | | | |



- AUTO MODE OPERATION
- TO BREAK BY POWER FAILURE OF AES INCOMING
- CLOSING CONDITION
- NOT FAULT CONDITION (UV, OC, OCG)
 - NOT INTER-LOCK WITH MUTUAL RECEIVING VACUUM CIRCUIT BREAKER

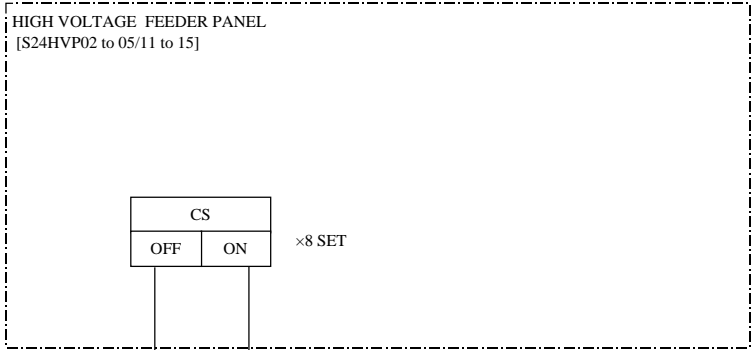
C2-2

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|--------------|-----------------|-----|---|-----|------|
| | | LP | HV | CRT | OPERATION | PR | |
| ON | | | ○×2 | ○×2 | | ○×2 | |
| OFF | | | ○×2 | ○×2 | | ○×2 | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| ON - OFF | CS | | ○×2 | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | ○×2 | ○×2 | |
| UNDER VOLTAGE | T | | ○×2 | | | | |
| OVER CURRENT | T | | ○×2 | | | | |
| OVER CURRENT GROUNDING | T | | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| FACILITY NAME | | POWER RECEIVING STATION | | | | ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | | SLUDGE TREATMENT BUILDING MONITORING ROOM | | | NOTE | | |
|--|-------------|-------------------------|---|----------|---|-------------------------------|------------------------|-----------------|-----------------|-----|--|-----------|-----|------|-----|-----|
| TAG No. | S24HVP01/16 | EQUIPMENT NAME | STATIC CAPACTOR FEEDER PANEL VACUUM CIRCUIT BREAKER | CAPACITY | - | | | | LP | HV | CRT | OPERATION | PR | | | |
| DRIVE SYSTEM | | | | | | | | | | | | | | | | |
| <div style="border: 1px dashed black; padding: 5px; margin-bottom: 20px;"> STATIC CAPACTOR FEEDER PANEL L S24HVP01/16 </div> <p style="margin-top: 20px;"> AUTO MODE OPERATION 1. TO BREAK BY POWER FAILURE OF TNB INCOMING </p> <p style="margin-top: 20px;"> CLOSING CONDITION 1. NOT FAULT CONDITION (OC, OCG) 2. NOT INTER-LOCK WITH INCOMING VACUUM CIRCUIT BREAKER </p> | | | | | | DRIVE / CONDITION INDICATIONS | ON | | | ○×2 | ○×2 | | ○×2 | | | |
| | | | | | | DRIVE OPERATION | OFF | | | ○×2 | ○×2 | | ○×2 | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | ON - OFF | CS | | ○×2 | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | FAULT | | | | | | | | ○×2 | ○×2 |
| | | | | | | FAULT / ABNORMAL INDICATIONS | OVER CURRENT | T | | | | | ○×2 | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | OVER CURRENT GROUNDING | T | | | | | ○×2 | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |

| | | | | | |
|---------------|-----------------------|---------------------------|--|----------|---|
| FACILITY NAME | | SLUDGE TREATMENT BUILDING | | | |
| TAG No. | 24HVP02 to 05/11 to 1 | EQUIPMENT NAME | HIGHT VOLTAGE FEEDER PANEL VACUUM CIRCUIT BREAKERS | CAPACITY | - |

DRIVE SYSTEM



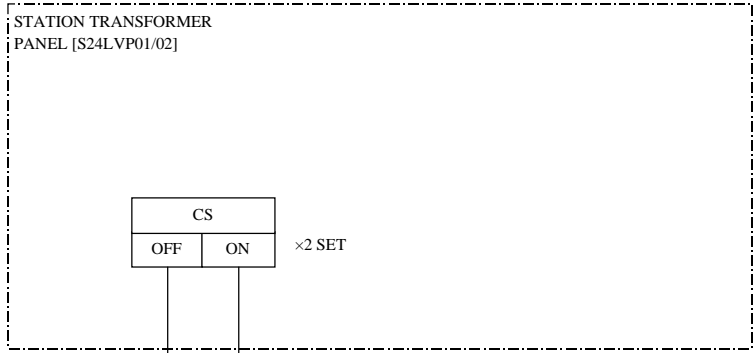
CLOSING CONDITION
 1. NOT FAULT CONDITION (OC, OCG)
 2. NOT INTER-LOCK WITH INCOMING VACUUM CIRCUIT BREAKER

C2-4

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|--------------|-----------------|-----|---|----|------|
| | | LP | HV | CRT | OPERATION | PR | |
| ON | | | ○×8 | | ○×8 | | ○×8 |
| OFF | | | ○×8 | | ○×8 | | ○×8 |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| ON - OFF | CS | | ○×8 | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | ○×8 | | ○×8 |
| OVER CURRENT | T | | ○×8 | | | | |
| OVER CURRENT GROUNDING | T | | ○×8 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|-------------|---------------------------|-----------------------------|----------|---|
| FACILITY NAME | | SLUDGE TREATMENT BUILDING | | | |
| TAG No. | S24LVP01/02 | EQUIPMENT NAME | TRANSFORMER SECONDARY PANEL | CAPACITY | - |

DRIVE SYSTEM

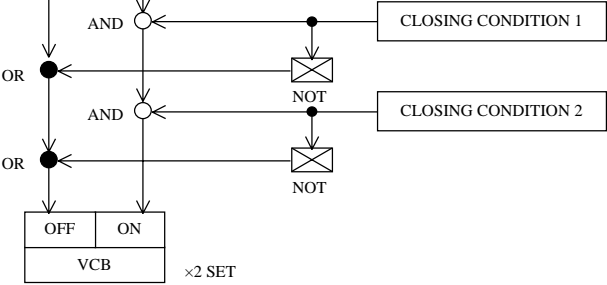
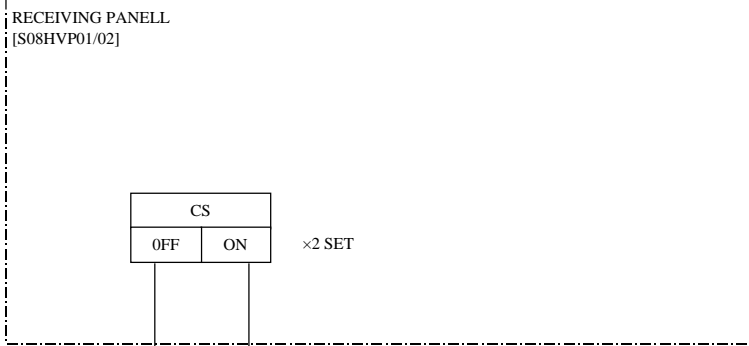


CLOSING CONDITION
1. NOT FAULT CONDITION (OC, OCG)

C2-6

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | #REF! | | | NOTE |
|-------------------------------|----------------|--------------|-----------------|-------|-----------|-----|------|
| | | LP | LV | CRT | OPERATION | PR | |
| ON | | | ○×2 | ○×2 | | ○×2 | |
| OFF | | | ○×2 | ○×2 | | ○×2 | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| ON - OFF | CS | | ○×2 | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○×2 | | ○×2 | |
| OVER CURRENT | T | | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|-------------|----------------|-----------------|----------|---|
| FACILITY NAME | | BLOWER HOUSE | | | |
| TAG No. | S08HVP01/02 | EQUIPMENT NAME | RECEIVING PANEL | CAPACITY | - |
| DRIVE SYSTEM | | | | | |



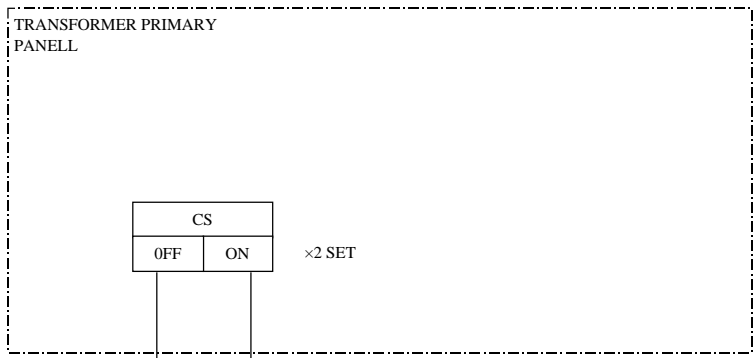
CLOSING CONDITION
 1. NOT FAULT CONDITION (OC, OCG)
 2. NOT INTER-LOCK WITH MUTUAL RECEIVING VACUUM CIRCUIT BREAKER

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|--------------|-----------------|-----|---|-----|------|
| | | LP | HV | CRT | OPERATION | PR | |
| ON | | | ○×2 | ○×2 | | ○×2 | |
| OFF | | | ○×2 | ○×2 | | ○×2 | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| ON - OFF | CS | | ○×2 | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | ○×2 | ○×2 | |
| OVER CURRENT | T | | ○×2 | | | | |
| OVER CURRENT GROUNDING | T | | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

C2-7

C2-8

| | | | | | |
|---------------|-------------|----------------|---------------------------|----------|---|
| FACILITY NAME | | BLOWER HOUSE | | | |
| TAG No. | S08HVP03/05 | EQUIPMENT NAME | TRANSFORMER PRIMARY PANEL | CAPACITY | - |
| DRIVE SYSTEM | | | | | |

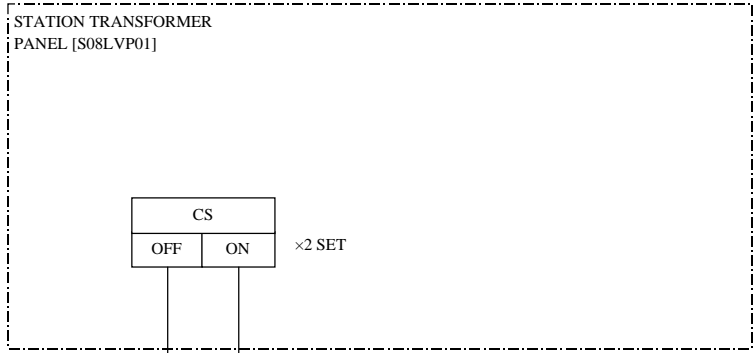


CLOSING CONDITION
 1. NOT FAULT CONDITION (OC, OCG)
 2. NOT INTER-LOCK WITH MUTUAL RECEIVING VACUUM CIRCUIT BREAKER

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|--------------|-----------------|-----|---|-----|------|
| | | LP | HV | CRT | OPERATION | PR | |
| ON | | | ○×2 | ○×2 | | ○×2 | |
| OFF | | | ○×2 | ○×2 | | ○×2 | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| ON - OFF | CS | | ○×2 | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | ○×2 | ○×2 | |
| OVER CURRENT | T | | ○×2 | | | | |
| OVER CURRENT GROUNDING | T | | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|----------|----------------|-----------------------------|----------|---|
| FACILITY NAME | | BLOWER HOUSE | | | |
| TAG No. | S08LVP01 | EQUIPMENT NAME | TRANSFORMER SECONDARY PANEL | CAPACITY | - |

DRIVE SYSTEM



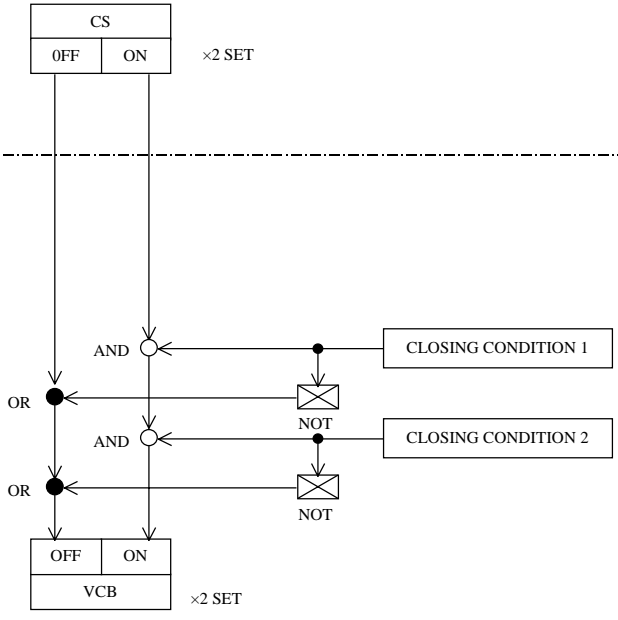
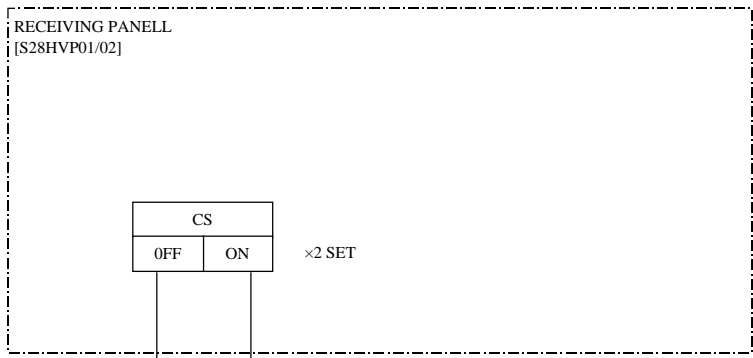
CLOSING CONDITION
1. NOT FAULT CONDITION (OC)

C2-10

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|--------------|-----------------|---|-----------|------|
| | | LP | LV | CRT | OPERATION | |
| ON | | | ○×2 | ○×2 | ○×2 | |
| OFF | | | ○×2 | ○×2 | ○×2 | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| ON - OFF | CS | | ○×2 | | | |
| DRIVE OPERATION | | | | | | |
| FAULT | | | | ○×2 | ○×2 | |
| OVER CURRENT | T | | ○×2 | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |

C2-11

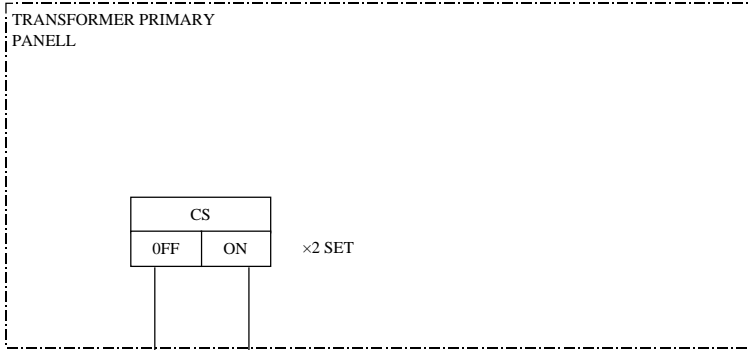
| | | | | | |
|---------------|-------------|------------------|-----------------|----------|---|
| FACILITY NAME | | ELECTRICAL HOUSE | | | |
| TAG No. | S28HVP01/02 | EQUIPMENT NAME | RECEIVING PANEL | CAPACITY | - |
| DRIVE SYSTEM | | | | | |



CLOSING CONDITION
 1. NOT FAULT CONDITION (OC, OCG)
 2. NOT INTER-LOCK WITH MUTUAL RECEIVING VACUUM CIRCUIT BREAKER

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|--------------|-----------------|-----|---|----|------|
| | | LP | HV | CRT | OPERATION | PR | |
| ON | | | ○×2 | | ○×2 | | ○×2 |
| OFF | | | ○×2 | | ○×2 | | ○×2 |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| ON - OFF | CS | | ○×2 | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | ○×2 | | ○×2 |
| OVER CURRENT | T | | ○×2 | | | | |
| OVER CURRENT GROUNDING | T | | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|-------------|------------------|---------------------------|----------|---|
| FACILITY NAME | | ELECTRICAL HOUSE | | | |
| TAG No. | S08HVP03/05 | EQUIPMENT NAME | TRANSFORMER PRIMARY PANEL | CAPACITY | - |
| DRIVE SYSTEM | | | | | |



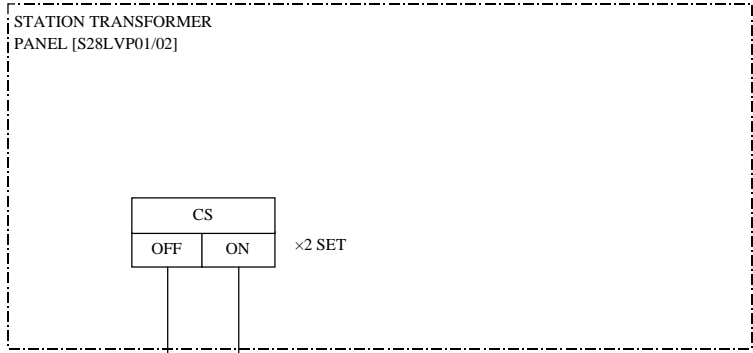
CLOSING CONDITION
 1. NOT FAULT CONDITION (OC, OCG)
 2. NOT INTER-LOCK WITH MUTUAL TRANSFORMER PRIMARY PANEL VACUUM CIRCUIT BREAKER

C2-12

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|--------------|-----------------|-----|---|-----|------|
| | | LP | HV | CRT | OPERATION | PR | |
| ON | | | ○×2 | ○×2 | | ○×2 | |
| OFF | | | ○×2 | ○×2 | | ○×2 | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| ON - OFF | CS | | ○×2 | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | ○×2 | ○×2 | |
| OVER CURRENT | T | | ○×2 | | | | |
| OVER CURRENT GROUNDING | T | | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|-------------|------------------|-----------------------------|----------|---|
| FACILITY NAME | | ELECTRICAL HOUSE | | | |
| TAG No. | S28LVP01/02 | EQUIPMENT NAME | TRANSFORMER SECONDARY PANEL | CAPACITY | - |

DRIVE SYSTEM



CLOSING CONDITION
1. NOT FAULT CONDITION (OC)

C2-14

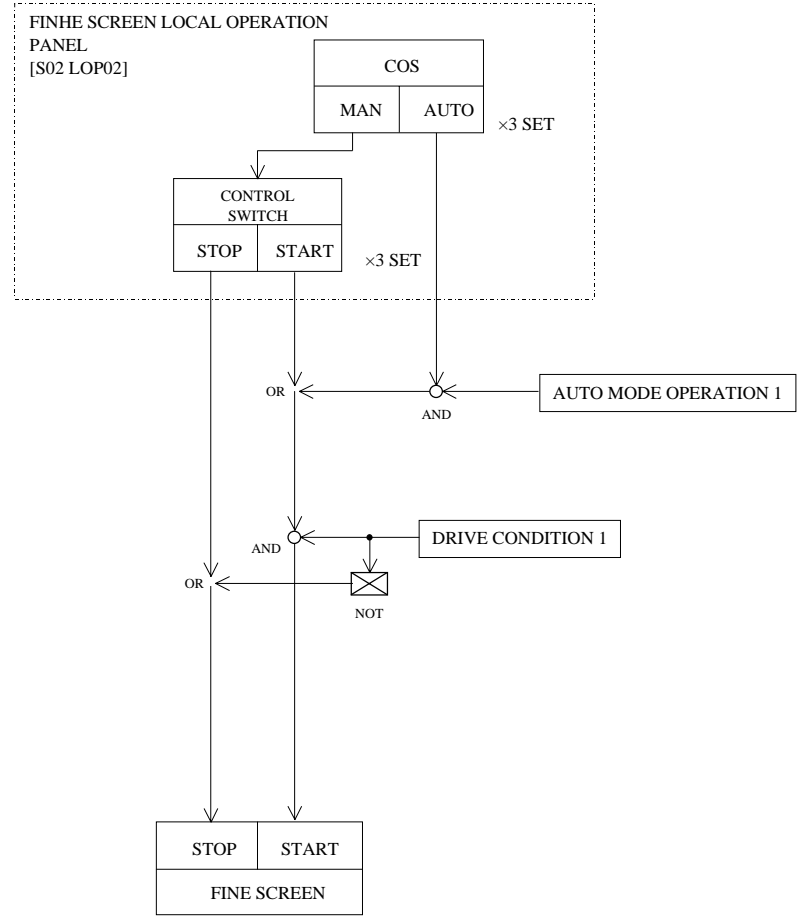
| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|--------------|-----------------|---|-----------|------|
| | | LP | LV | CRT | OPERATION | |
| ON | | | ○×2 | ○×2 | ○×2 | |
| OFF | | | ○×2 | ○×2 | ○×2 | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| ON - OFF | CS | | ○×2 | | | |
| DRIVE OPERATION | | | | | | |
| FAULT | | | | ○×2 | ○×2 | |
| OVER CURRENT | T | | ○×2 | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |

| FACILITY NAME | | INLET CHAMBER | | | | ITEM | STOP CONDITION | LOCAL (SITE) | INFLUENT PUMP STATION LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE | | | |
|--|---------|----------------|--------------------|----------|--------|-------------------------------|----------------|--------------|--|---|-----------|----|------|--|--|--|
| TAG No. | S01MG01 | EQUIPMENT NAME | INLET CHAMBER GATE | CAPACITY | 2.2 kW | | | LP | PLC | CRT | OPERATION | PR | | | | |
| DRIVE SYSTEM | | | | | | | | | | | | | | | | |
| | | | | | | DRIVE / CONDITION INDICATIONS | | | | | | | | | | |
| | | | | | | OPEN | | | | | | | | | | |
| | | | | | | STOP | | | | | | | | | | |
| | | | | | | CLOSE | | | | | | | | | | |
| <p>DRIVE OPERATION</p> <p>MAN - OFF COS</p> <p>OPEN - STOP - CLOSE CS</p> | | | | | | DRIVE OPERATION | | | | | | | | | | |
| | | | | | | MAN - OFF | COS | | | | | | | | | |
| | | | | | | OPEN - STOP - CLOSE | CS | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| <p>FAULT / ABNORMAL INDICATIONS</p> <p>FAULT</p> <p>OVER LOAD T</p> <p>OVER TORQUE T</p> | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | |
| | | | | | | FAULT | | | | | | | | | | |
| | | | | | | OVER LOAD | T | | | | | | | | | |
| | | | | | | OVER TORQUE | T | | | | | | | | | |

- DRIVE CONDITION**
- Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
 - Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
 - NOT FAULT CONDITION (MCCB, THRY, OCG)

| | | | | | |
|---------------|----------------|-----------------------|-------------|----------|---------|
| FACILITY NAME | | INFLUENT PUMP STATION | | | |
| TAG No. | S02 MS11 to 31 | EQUIPMENT NAME | FINE SCREEN | CAPACITY | 0.75 kW |

DRIVE SYSTEM



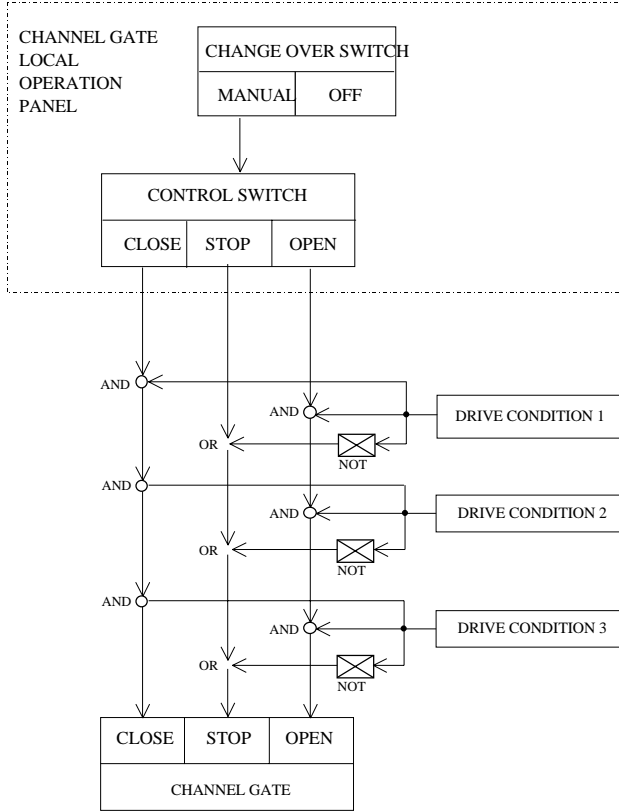
AUTO MODE OPERATION
1. TO OPERATE BASED ON PRE-SET TIME ING SEQUENCE

DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--------------|-----------------------------|---|-----------|-----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | | ○×3 | | | | | |
| AUTO | | ○×3 | | | | | |
| STOP | | ○×3 | | ○×3 | | | |
| START | | ○×3 | | ○×3 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | ○×3 | | | | | |
| START - STOP | CS | ○×3 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○×3 | | ○×3 | |
| OVER LOAD | T | ○×3 | | | | | |
| OVER CURRENT GROUNDING | T | ○×3 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | | | | | | | | | |
|---------------|---------------|-----------------------|--------------|----------|--------|------|-------------------|-----------------|---|--|-----------|----|------|
| FACILITY NAME | | INFLUENT PUMP STATION | | | | ITEM | STOP CONDITION | LOCAL (SITE) | INFLUENT PUMP STATION LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
| TAG No. | S02MG11 to 31 | EQUIPMENT NAME | CHANNEL GATE | CAPACITY | 0.4 kW | | | LP | MCC | CRT | OPERATION | PR | |

DRIVE SYSTEM



DRIVE CONDITION

1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
3. NOT FAULT CONDITION (MCCB, THRY, OCG)

DRIVE / CONDITION INDICATIONS

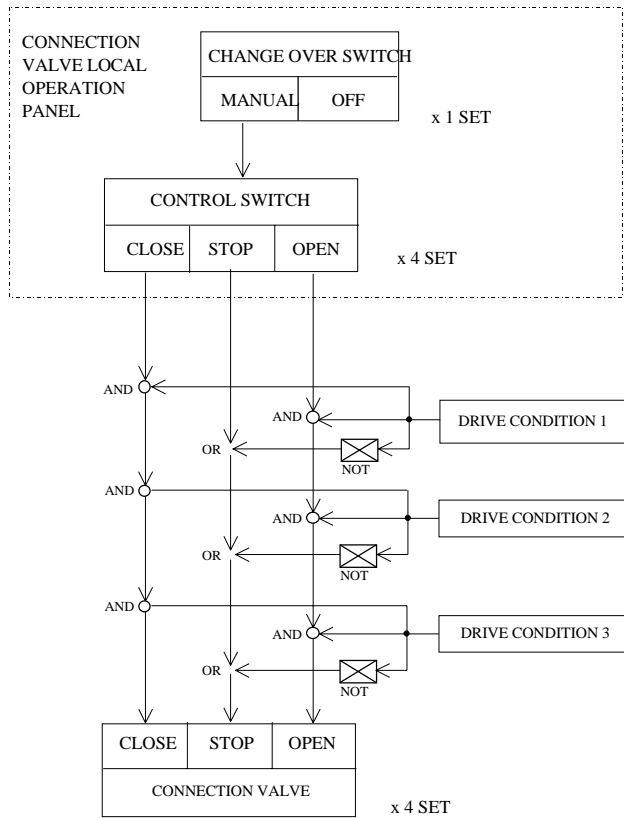
DRIVE OPERATION

FAULT / ABNORMAL INDICATIONS

| | | | | | | | |
|---------------------|-----|-------|-------|-------|--|-------|--|
| OPEN | | ○ x 3 | | ○ x 3 | | | |
| STOP | | ○ x 3 | | ○ x 3 | | | |
| CLOSE | | ○ x 3 | | ○ x 3 | | | |
| MAN - OFF | COS | ○ x 3 | | | | | |
| OPEN - STOP - CLOSE | CS | ○ x 3 | | | | | |
| FAULT | | | | ○ x 3 | | ○ x 3 | |
| OVER LOAD | T | | ○ x 3 | | | | |
| OVER TORQUE | T | | ○ x 3 | | | | |
| OVER CURRENT GROUND | T | | ○ x 3 | | | | |

| | | | | | |
|---------------|---------------|-----------------------|-------------------|----------|--------|
| FACILITY NAME | | INFLUENT PUMP STATION | | | |
| TAG No. | S02MG13 to 43 | EQUIPMENT NAME | CONNECTION VALVES | CAPACITY | 3.7 kW |

DRIVE SYSTEM



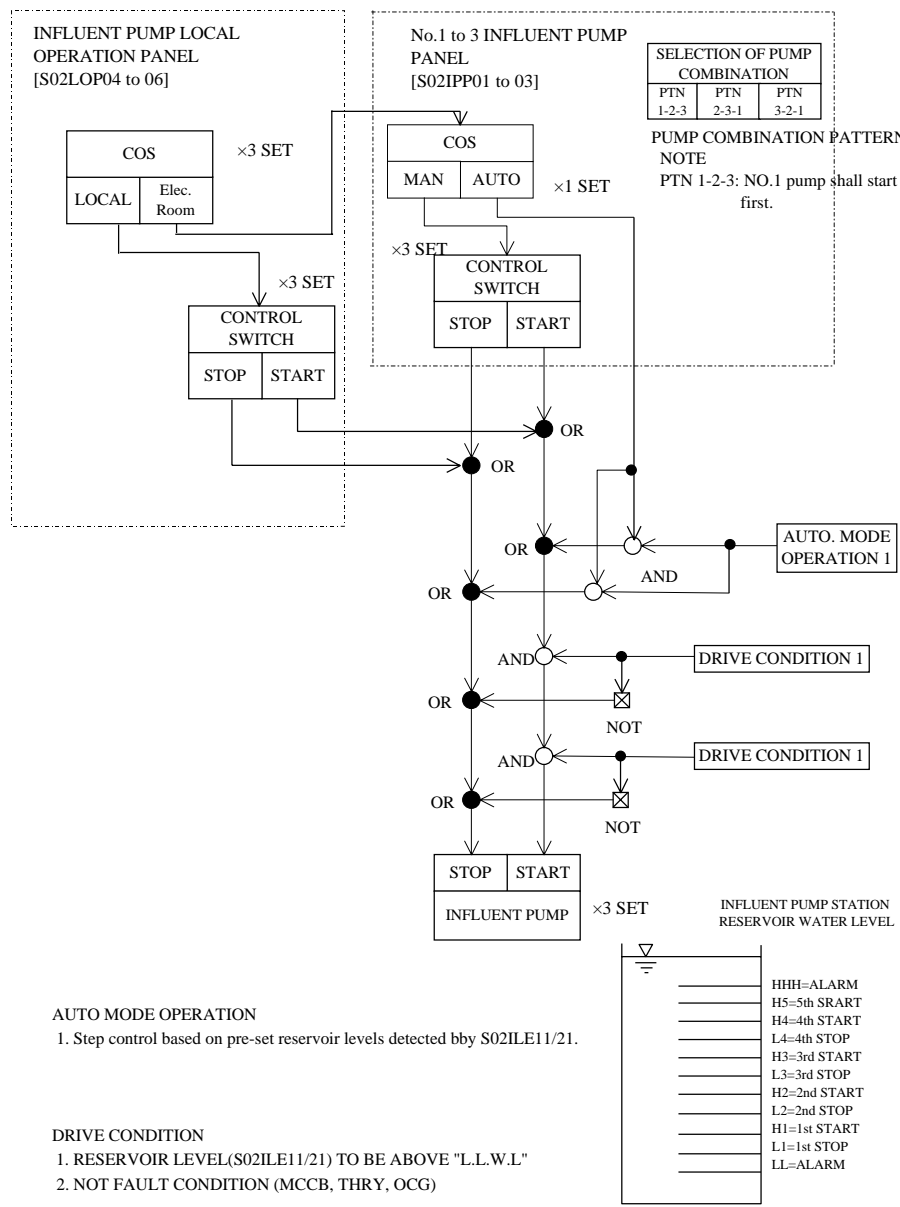
DRIVE CONDITION

1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | INFLUENT PUMP STATION LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | NOTE |
|-------------------------------|----------------|---------------------------|--|---|-----------|---------------------------|
| | | LP | MCC | CRT | OPERATION | |
| OPEN | | <input type="radio"/> x 4 | | <input type="radio"/> x 4 | | |
| STOP | | <input type="radio"/> x 4 | | <input type="radio"/> x 4 | | |
| CLOSE | | <input type="radio"/> x 4 | | <input type="radio"/> x 4 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| MAN - OFF | COS | <input type="radio"/> x 4 | | | | |
| OPEN - STOP - CLOSE | CS | <input type="radio"/> x 4 | | | | |
| DRIVE OPERATION | | | | | | |
| FAULT | | | | <input type="radio"/> x 4 | | <input type="radio"/> x 4 |
| OVER LOAD | T | | <input type="radio"/> x 4 | | | |
| OVER TORQUE | T | | <input type="radio"/> x 4 | | | |
| OVER CURRENT GROUNDING | T | | <input type="radio"/> x 4 | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |

| | | | | | |
|---------------|---------------|-----------------------|----------------|----------|--------|
| FACILITY NAME | | INFLUENT PUMP STATION | | | |
| TAG No. | S02IP10 to 03 | EQUIPMENT NAME | INFLUENT PUMPS | CAPACITY | 200 kW |

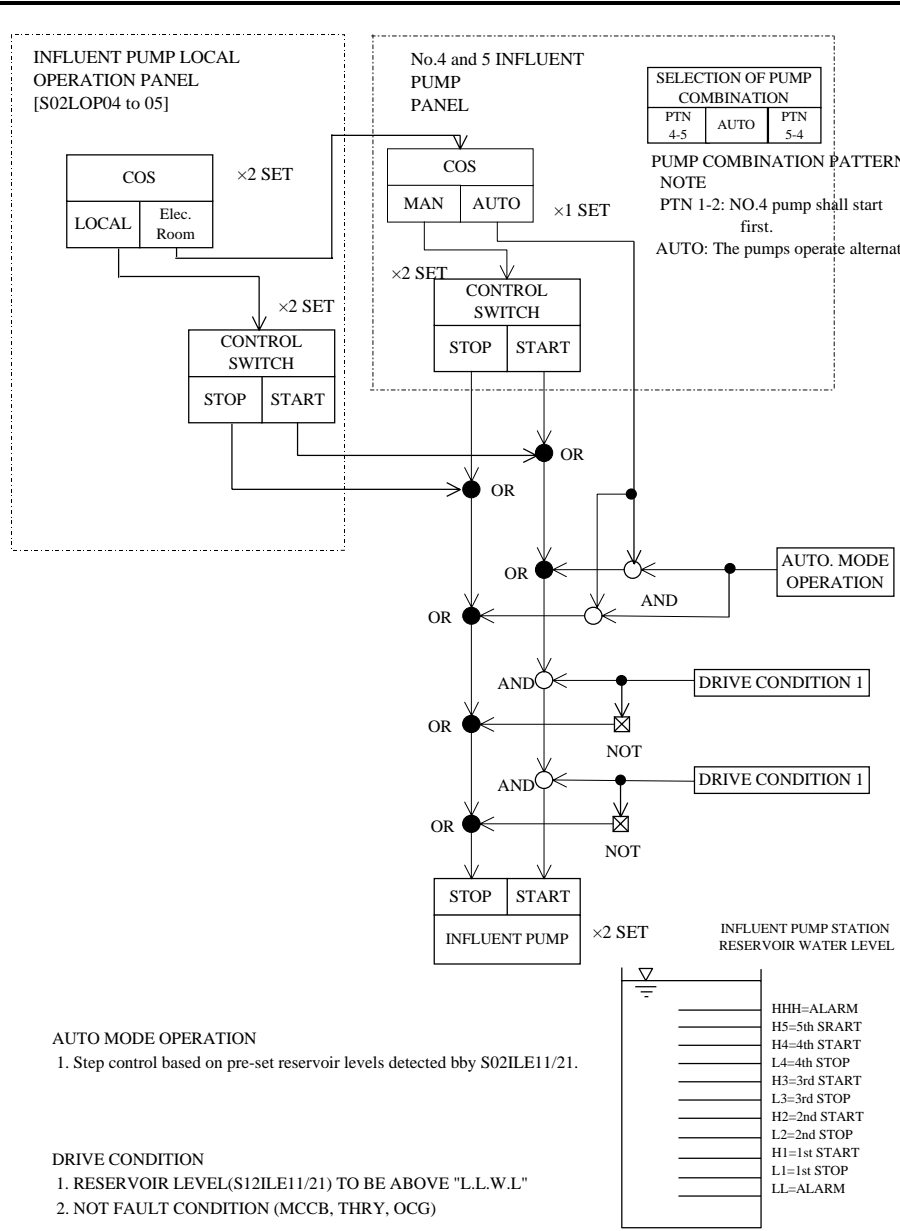
DRIVE SYSTEM



| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--|----------------|--------------|-----------------------------|---|-----------|-----|------|
| | | LP | INFLUENTR PUMP PANEL | CRT | OPERATION | PR | |
| MANUAL | | | ○×3 | | | | |
| AUTO | | | ○×3 | | | | |
| LOCAL | | ○×3 | | | | | |
| REMOTE | | ○×3 | | | | | |
| START | | ○×3 | ○×3 | ○×3 | | | |
| STOP | | ○×3 | ○×3 | ○×3 | | | |
| MAN - OFF - AUTO | | | ○ | | | | |
| LOCAL - Electrical Room | | ○×3 | | | | | |
| START - STOP | | ○×3 | ○×3 | | | | |
| FAULT | | | | ○×3 | | ○×3 | |
| OVER LOAD | T | ○×3 | ○×3 | | | | |
| OVER CURENT GROUNDIN | T | ○×3 | ○×3 | | | | |
| SEWAGE LIFT PUMP WET WELL LEVEL "H.H. W.L" | | ○ | ○ | ○ | | ○ | |
| SEWAGE LIFT PUMP WET WELL LEVEL "L.L.W.L" | T | ○ | ○ | ○ | | ○ | |
| SHAFT BEARING OVERHEA | T | ○×3 | ○×3 | | | | |
| NO SEAL WATER | T | ○×3 | ○×3 | | | | |
| JAM | T | ○×3 | ○×3 | | | | |

| | | | | | |
|---------------|---------------|-----------------------|----------------|----------|--------|
| FACILITY NAME | | INFLUENT PUMP STATION | | | |
| TAG No. | S02IP11 to 21 | EQUIPMENT NAME | INFLUENT PUMPS | CAPACITY | 110 kW |

DRIVE SYSTEM

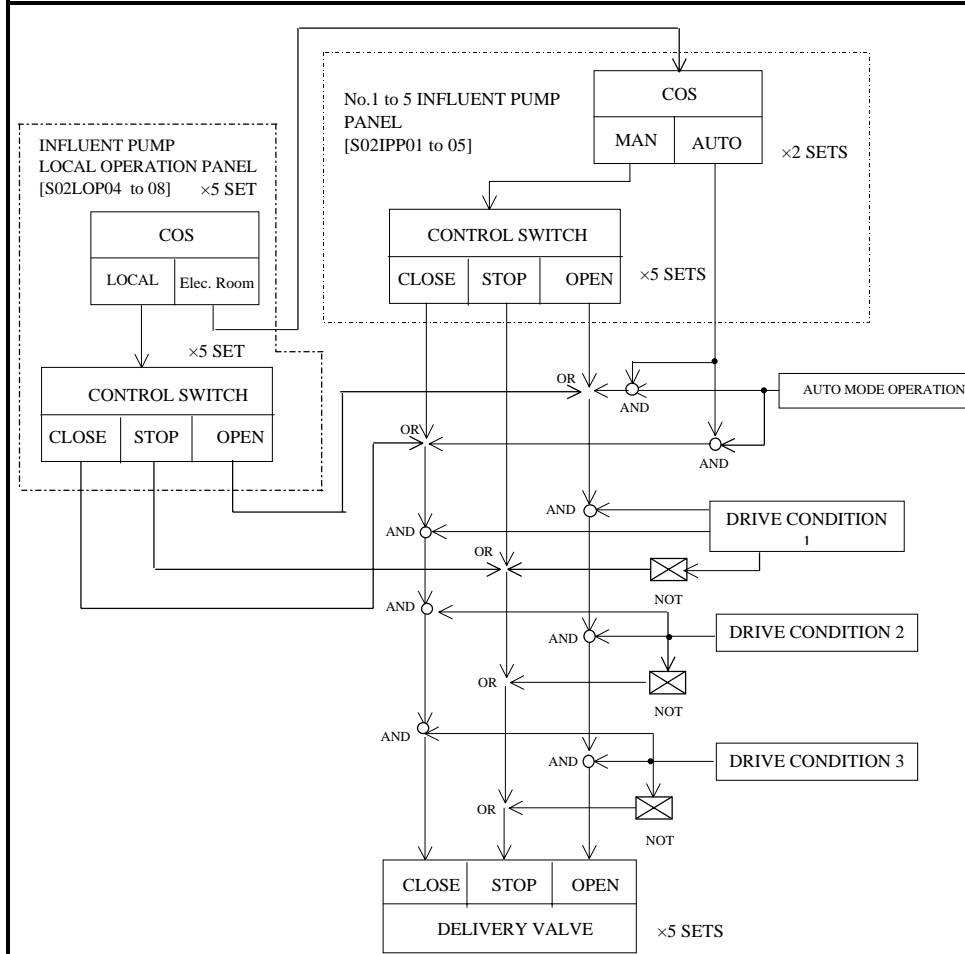


| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------|----------------|--------------|-----------------------------|---|-----------|-----|------|
| | | LP | INFLUENTR PUMP PANEL | CRT | OPERATION | PR | |
| MANUAL | | | ○×2 | | | | |
| AUTO | | | ○×2 | | | | |
| LOCAL | | ○×2 | ○×2 | | | | |
| Electrical Room | | ○×2 | ○×2 | | | | |
| START | | ○×2 | ○×2 | ○×2 | | | |
| STOP | | ○×2 | ○×2 | ○×2 | | | |
| MAN - OFF - AUTO | COS | | ○ | | | | |
| LOCAL - Electrical Room | COS | ○×2 | | | | | |
| START - STOP | CS | ○×2 | ○×2 | | | | |
| FAULT | | | | ○×2 | | ○×2 | |
| OVER LOAD | T | ○×2 | ○×2 | | | | |
| OVER CURENT GROUNDIN | T | ○×2 | ○×2 | | | | |
| SHAFT BEARING OVERHEA | T | ○×3 | ○×3 | | | | |
| NO SEAL WATER | T | ○×3 | ○×3 | | | | |
| JAM | T | ○×3 | ○×3 | | | | |

C2-20

| | | | | | |
|---------------|---------------|-----------------------|-----------------|----------|------------|
| FACILITY NAME | | INFLUENT PUMP STATION | | | |
| TAG No. | S02MV11 to 51 | EQUIPMENT NAME | DELIVERY VALVES | CAPACITY | 0.75/0.4kW |

DRIVE SYSTEM



AUTO MODE OPERATION

1. To open or close following the start or the stop of the relevant influent pump respectively with some time lag.

DRIVE CONDITION

1. Opening directional LS (Limit Switch) and closing directional not to be actuated during opening and closing respectively
2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|---------------------|----------------|--------------|-----------------------------|---|-----------|-----|------|
| | | LP | INFLUENT PUMP PANELS | CRT | OPERATION | PR | |
| AUTO | | | | | | | |
| MANUAL | | | | | | | |
| LOCAL | | | | | | | |
| REMOTE | | | | | | | |
| CLOSE | | ○×5 | ○×5 | ○×5 | | | |
| STOP | | ○×5 | ○×5 | ○×5 | | | |
| OPEN | | ○×5 | ○×5 | ○×5 | | | |
| MAN - AUTO | COS | | | | | | |
| LOCAL - REMOTE | COS | | | | | | |
| CLOSE - STOP - OPEN | CS | ○×5 | ○×5 | | | | |
| FAULT | | | | ○×5 | | ○×5 | |
| OVER LOAD | T | ○×5 | ○×5 | | | | |
| OVER TORQUE | T | ○×5 | ○×5 | | | | |
| OVER CURRENT GROUND | T | ○×5 | ○×5 | | | | |

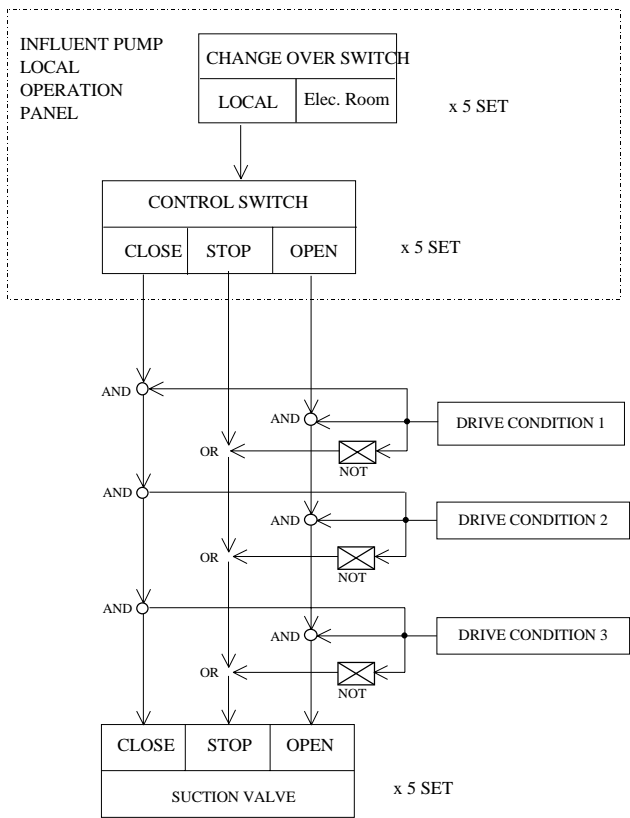
DRIVE / CONDITION INDICATIONS

DRIVE OPERATION

FAULT / ABNORMAL INDICATIONS

| | | | | | |
|---------------|---------------|-----------------------|----------------|----------|-------------|
| FACILITY NAME | | INFLUENT PUMP STATION | | | |
| TAG No. | S02MV12 to 52 | EQUIPMENT NAME | SUCTION VALVES | CAPACITY | 3.7/1.5 k W |

DRIVE SYSTEM



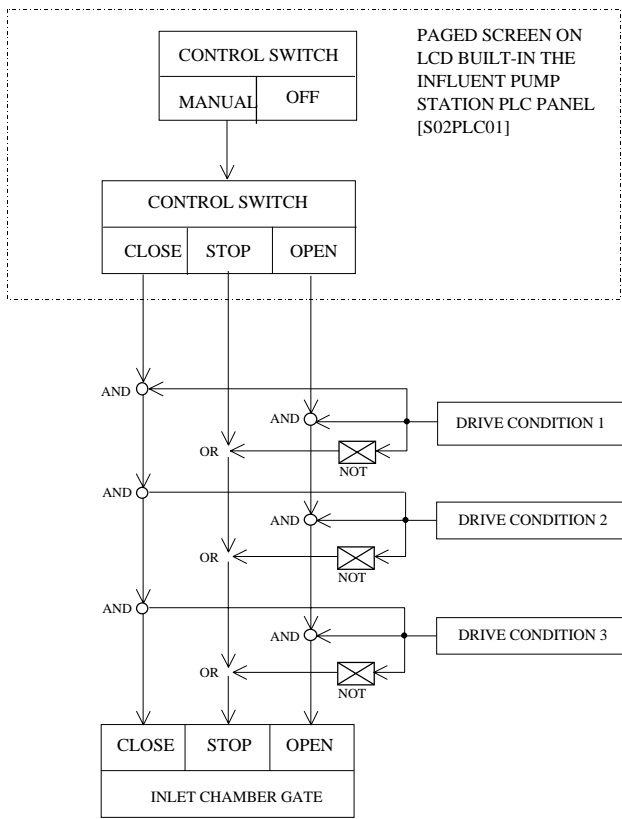
DRIVE CONDITION

1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | INFLUENT PUMP STATION LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|-------------------------|---------------------------|--|---|-----------|---------------------------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | OPEN | <input type="radio"/> x 5 | | <input type="radio"/> x 5 | | | |
| | STOP | <input type="radio"/> x 5 | | <input type="radio"/> x 5 | | | |
| | CLOSE | <input type="radio"/> x 5 | | <input type="radio"/> x 5 | | | |
| DRIVE OPERATION | LOCAL - Electrical Room | COS | <input type="radio"/> x 5 | | | | |
| | OPEN - STOP - CLOSE | CS | <input type="radio"/> x 5 | | | | |
| FAULT / ABNORMAL INDICATIONS | FAULT | | | <input type="radio"/> x 5 | | <input type="radio"/> x 5 | |
| | OVER LOAD | T | | <input type="radio"/> x 5 | | | |
| | OVER TORQUE | T | | <input type="radio"/> x 5 | | | |
| | OVER CURRENT GROUNDING | T | | <input type="radio"/> x 5 | | | |

| | | | | | |
|---------------|---------|----------------|-------------|----------|--------|
| FACILITY NAME | | GATE CHAMBER | | | |
| TAG No. | S01MG02 | EQUIPMENT NAME | BYPASS GATE | CAPACITY | 5.5 kW |

DRIVE SYSTEM



PAGED SCREEN ON LCD BUILT-IN THE INFLUENT PUMP STATION PLC PANEL [S02PLC01]

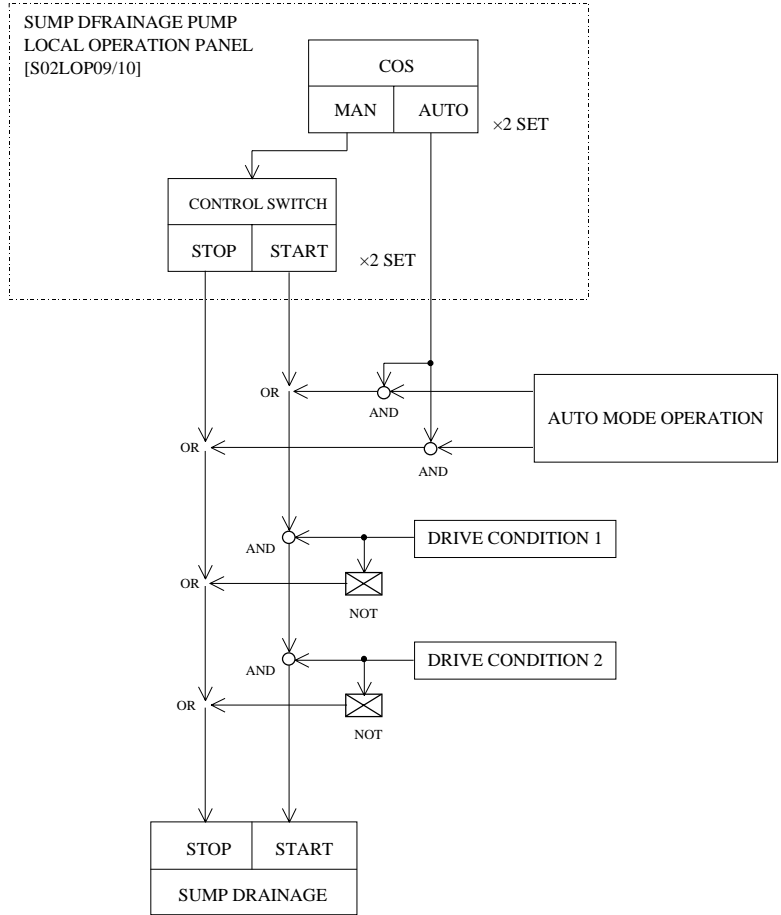
DRIVE CONDITION

1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | INFLUENT PUMP STATION LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--------------|--|---|-----------|----|------|
| | | LP | PLC | CRT | OPERATION | PR | |
| OPEN | | | ○ | ○ | | | |
| STOP | | | ○ | ○ | | | |
| CLOSE | | | ○ | ○ | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - OFF | COS | | ○ | | | | |
| OPEN - STOP - CLOSE | CS | | ○ | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ | | ○ | |
| OVER LOAD | T | | ○ | | | | |
| OVER TORQUE | T | | ○ | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|------------|-----------------------|---------------------|----------|--------|
| FACILITY NAME | | INFLUENT PUMP STATION | | | |
| TAG No. | S02DP01/02 | EQUIPMENT NAME | SUMP DRAINAGE PUMPS | CAPACITY | 1.5 kW |

DRIVE SYSTEM



AUTO MODE OPERATION

1. TO operate based on pre-set sump pit levels, "H.W.L" as start and "L.W.L" as stop respectively, detected by S02ILS11/21.

DRIVE CONDITION

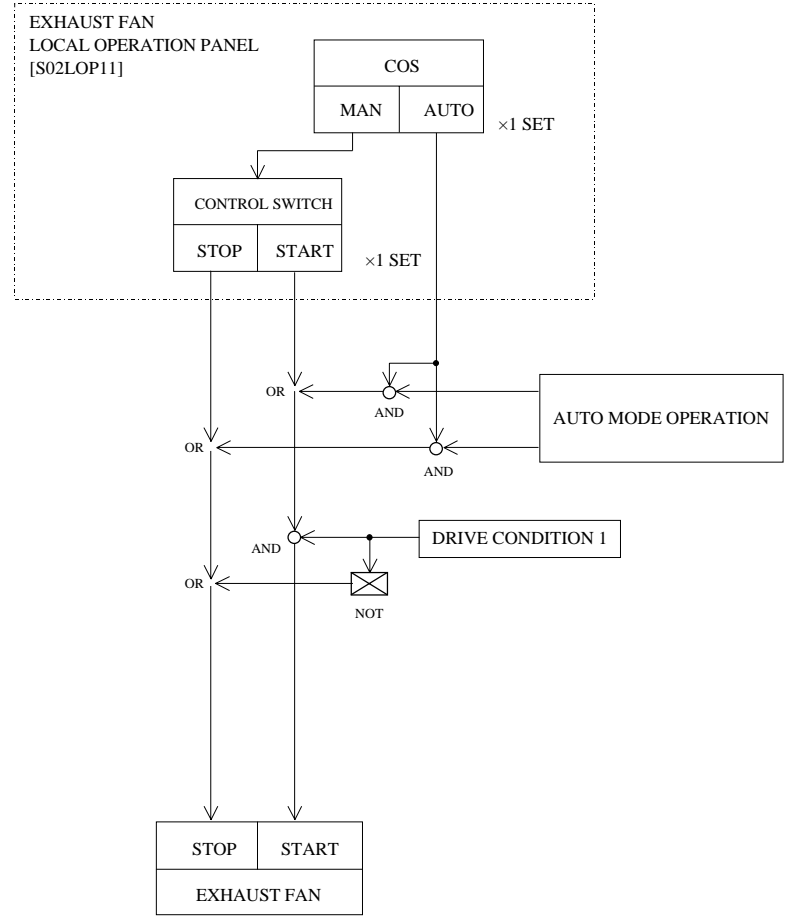
1. SUMP PIT LEVEL(S02ILS11/21) TO BE ABOVE "L.L.W.L"
2. NOT FAULT CONDITION (MCCB, THRY, OCG)

The concept of this operational diagram shall be applied to the following sump drainage pumps.
S05DP01/02, S08DP01, S12DP01/02, S21DP01, an S23DP01

| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--------------|-----------------------------|---|-----------|-----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | | ○×2 | | | | | |
| AUTO | | ○×2 | | | | | |
| STOP | | ○×2 | | ○×2 | | | |
| START | | ○×2 | | ○×2 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | ○×2 | | | | | |
| START - STOP | COS | ○×2 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○×2 | | ○×2 | |
| OVER LOAD | T | ○×2 | | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | | |
| SUMP PIT LEVEL "L.L.W.L" | T | ○×2 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|---------|-----------------------|-------------|----------|---------|
| FACILITY NAME | | INFLUENT PUMP STATION | | | |
| TAG No. | S02EF01 | EQUIPMENT NAME | EXHAUST FAN | CAPACITY | 0.75 kW |

DRIVE SYSTEM



AUTO MODE OPERATION
1. TO OPERATE BASED ON PRE-SET TIMING SEQUENCE

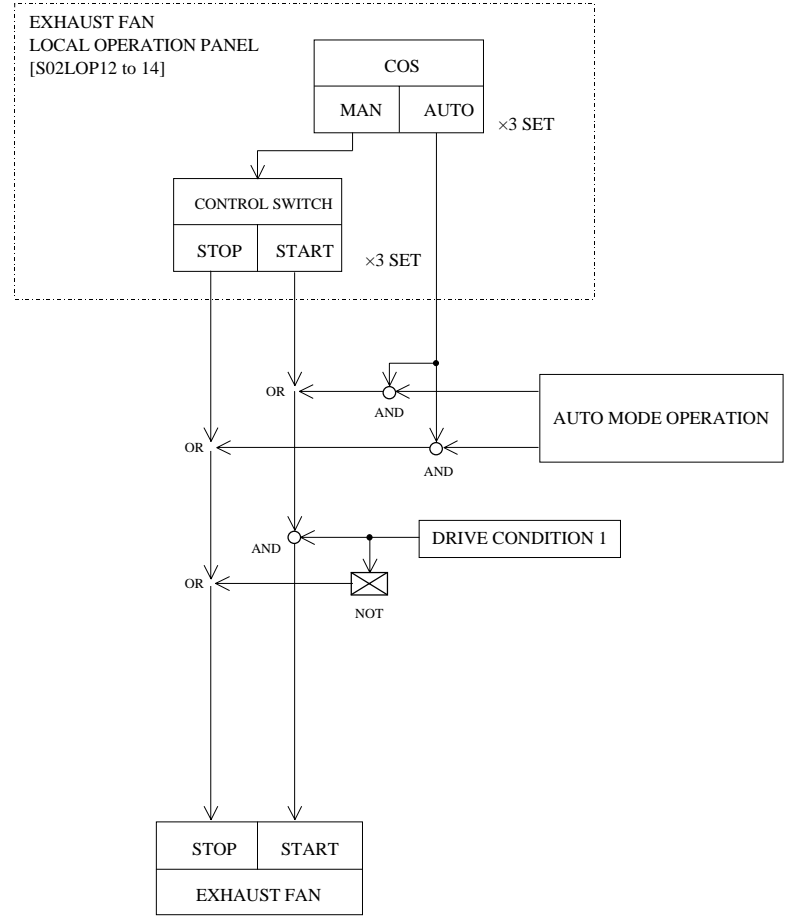
DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

The concept of this operational diagram shall be applied to the following exhaust fans.
S05EF01/02, S21EF01, S23EF01/02, S27EF01, S51EF01, S52EF01, S53EF01, S54EF401, S55 EF01, S56EF01, S57EF01, S58EF01, S59EF01, S60EF01/02, S61EF01, S62EF01, and S63EF01

| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--------------|-----------------------------|---|-----------|----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MANUAL | | ○ | | | | | |
| AUTO | | ○ | | | | | |
| STOP | | ○ | | ○ | | | |
| START | | ○ | | ○ | | | |
| DRIVE OPERATION | | | | | | | |
| MAN - AUTO | COS | ○ | | | | | |
| START - STOP | COS | ○ | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |
| FAULT | | | | ○ | | ○ | |
| OVER LOAD | T | ○ | | | | | |
| OVER CURRENT GROUND | T | ○ | | | | | |

| | | | | |
|---------------|---------------|-----------------------|-----------------|----------------------|
| FACILITY NAME | | INFLUENT PUMP STATION | | |
| TAG No. | S02IF01 to 03 | EQUIPMENT NAME | AIR INTAKE FANS | CAPACITY 0.75/3.7 Kw |

DRIVE SYSTEM



AUTO MODE OPERATION
1. TO OPERATE BASED ON PRE-SET TIMING SEQUENCE

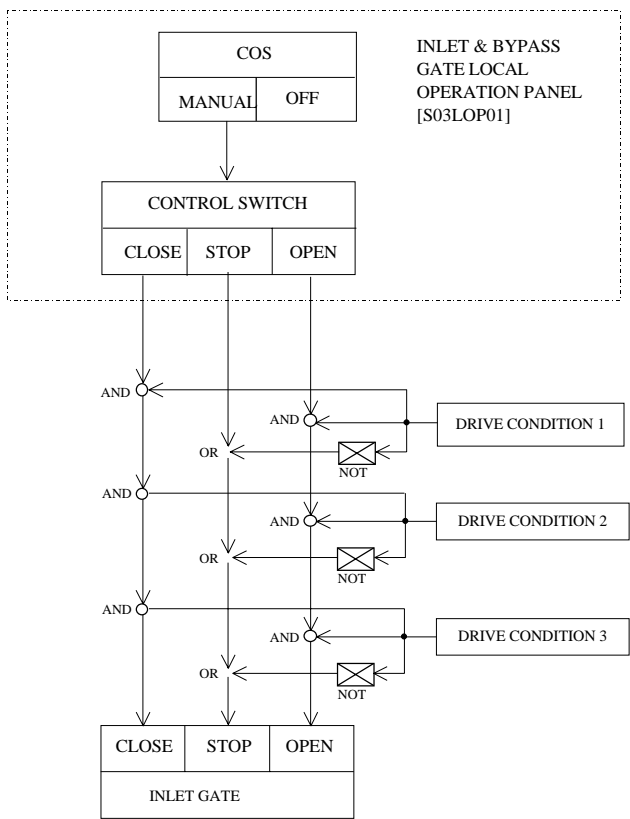
DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

The concept of this operational diagram shall be applied to the following air intake fans.
S12IF01/021, S23IF, S51IF01, S52IF01, S53IF01, S54IF401, S56IF01/02/03, S57IF01, S58IF01, S59IF01, S60IF01, S62IF01, and S63IF01

| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--------------|-----------------------------|---|-----------|-----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | | ○×3 | | | | | |
| AUTO | | ○×3 | | | | | |
| STOP | | ○×3 | | ○×3 | | | |
| START | | ○×3 | | ○×3 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | ○×3 | | | | | |
| START - STOP | COS | ○×3 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○×3 | | ○×3 | |
| OVER LOAD | T | ○×3 | | | | | |
| OVER CURRENT GROUND | T | ○×3 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|------------|----------------|------------|----------|--------|
| FACILITY NAME | | GRIT CHAMBER | | | |
| TAG No. | S03MG01/02 | EQUIPMENT NAME | INLET GATE | CAPACITY | 1.5 Kw |

DRIVE SYSTEM

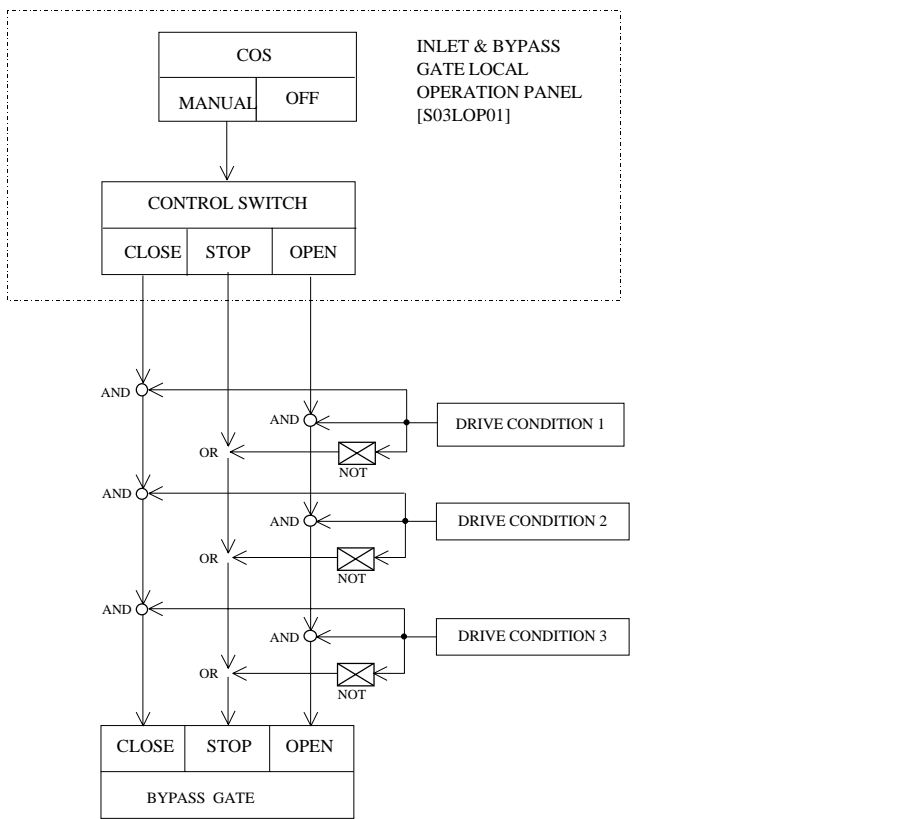


- DRIVE CONDITION**
1. OPENING DIRECTIONAL L S (Limit Switch) AND CLOSING DIRECTIONAL LS NOT TO BE ACTUATED DURING OPENING AND CLOSING RESPECTIVELY
 2. OPENING DIRECTIONAL TS (Torque limit switch) AND CLOSING DIRECTIONAL TS NOT TO BE ACTUATED DURING OPENING AND CLOSING RESPECTIVELY
 3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2 F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|---------------------|--------------|--|--|-----------------------|----|-----------------------|
| | | LP | MCC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | OPEN | | <input type="radio"/> | | <input type="radio"/> | | |
| | STOP | | <input type="radio"/> | | <input type="radio"/> | | |
| | CLOSE | | <input type="radio"/> | | <input type="radio"/> | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| DRIVE OPERATION | MAN - OFF | COS | <input type="radio"/> | | | | |
| | OPEN - STOP - CLOSE | CS | <input type="radio"/> | | | | |
| | | | | | | | |
| FAULT / ABNORMAL INDICATIONS | FAULT | | | | <input type="radio"/> | | <input type="radio"/> |
| | OVER LOAD | T | <input type="radio"/> | | | | |
| | OVER TORQUE | T | <input type="radio"/> | | | | |
| | OVER CURRENT GROUND | T | <input type="radio"/> | | | | |
| | | | | | | | |

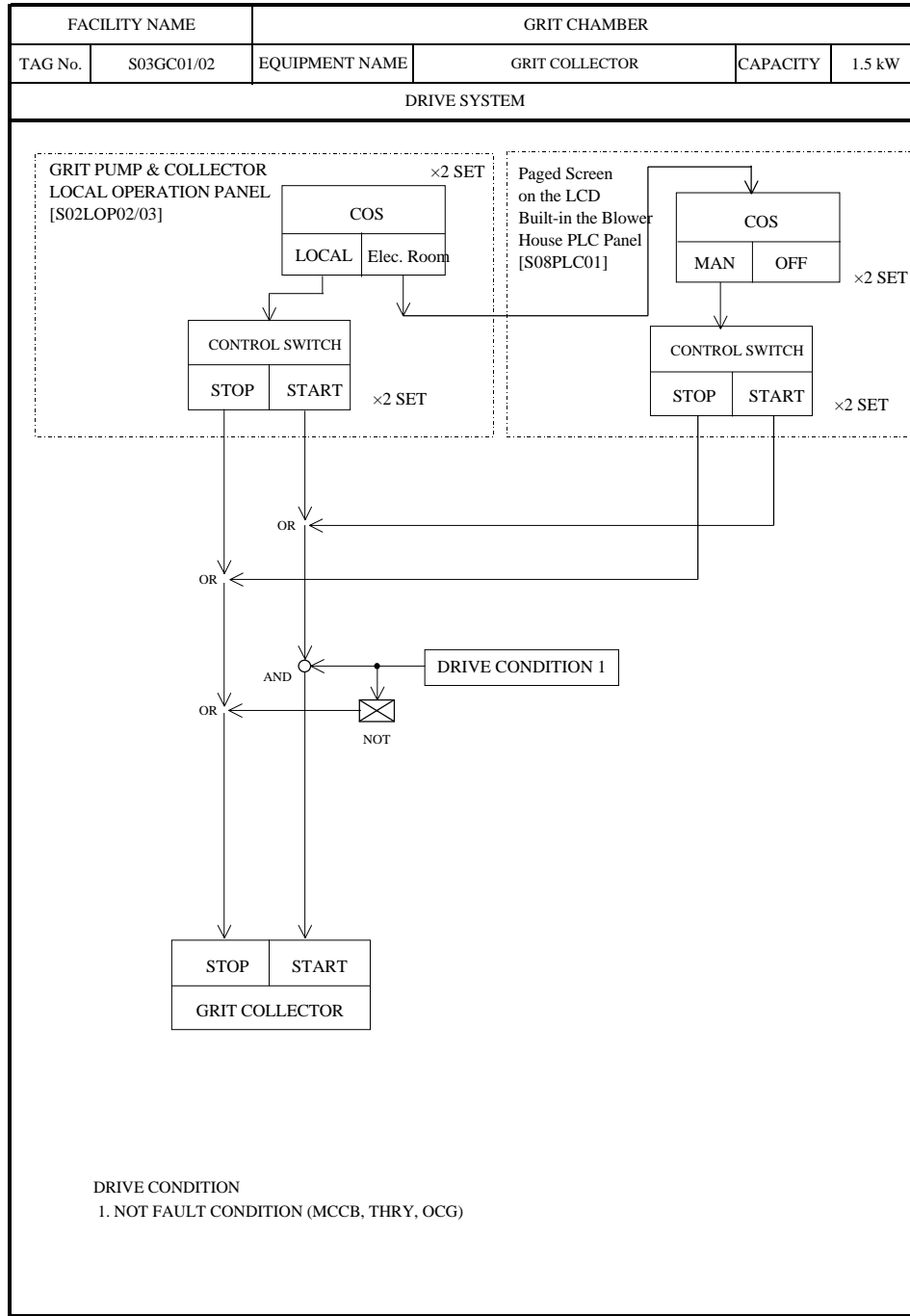
| | | | | | |
|---------------|---------|----------------|-------------|----------|--------|
| FACILITY NAME | | GRIT CHAMBER | | | |
| TAG No. | S03MG03 | EQUIPMENT NAME | BYPASS GATE | CAPACITY | 2.2 kW |

DRIVE SYSTEM



- DRIVE CONDITION**
1. OPENING DIRECTIONAL L S (Limit Switch) AND CLOSING DIRECTIONAL LS NOT TO BE ACTUATED DURING OPENING AND CLOSING RESPECTIVELY
 2. OPENING DIRECTIONAL TS (Torque limit switch) AND CLOSING DIRECTIONAL TS NOT TO BE ACTUATED DURING OPENING AND CLOSING RESPECTIVELY
 3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2 F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|---------------------|--------------|--|--|-----------------------|----|-----------------------|
| | | LP | MCC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | OPEN | | <input type="radio"/> | | <input type="radio"/> | | |
| | STOP | | <input type="radio"/> | | <input type="radio"/> | | |
| | CLOSE | | <input type="radio"/> | | <input type="radio"/> | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| DRIVE OPERATION | MAN - OFF | COS | <input type="radio"/> | | | | |
| | OPEN - STOP - CLOSE | CS | <input type="radio"/> | | | | |
| | | | | | | | |
| FAULT / ABNORMAL INDICATIONS | FAULT | | | | <input type="radio"/> | | <input type="radio"/> |
| | OVER LOAD | T | <input type="radio"/> | | | | |
| | OVER TORQUE | T | <input type="radio"/> | | | | |
| | OVER CURRENT GROUND | T | <input type="radio"/> | | | | |
| | | | | | | | |

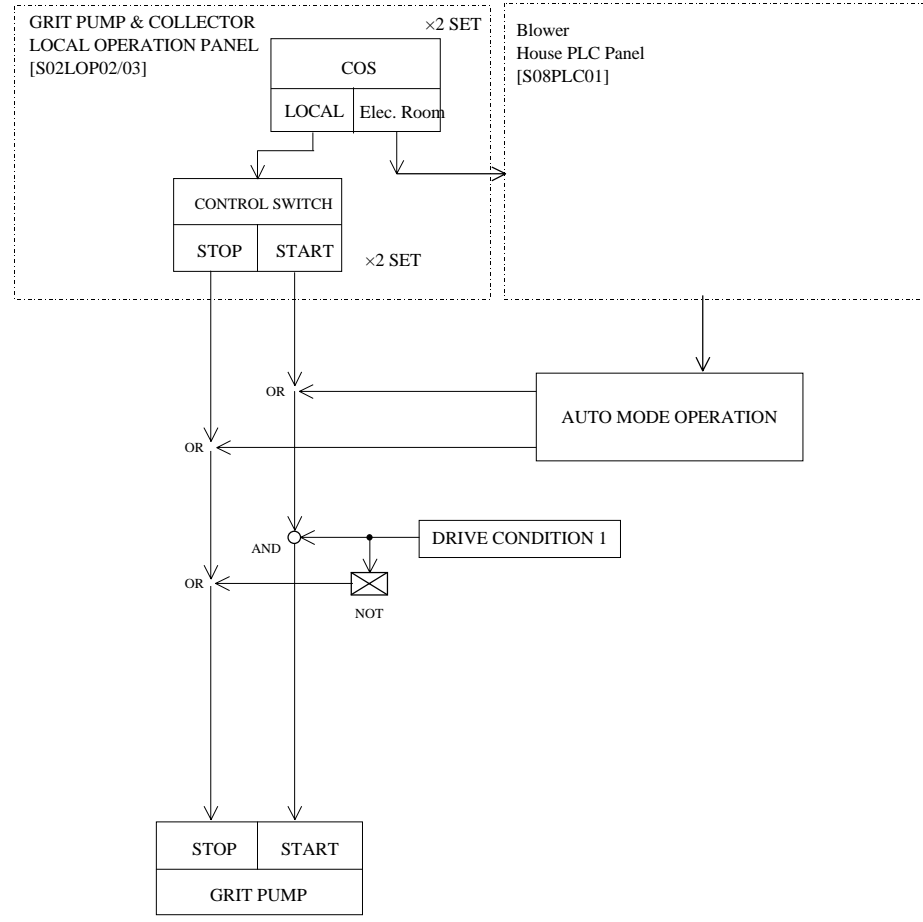


C2-29

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--------------|------------------------------------|---|-----------|----|------|
| | | LP | PLC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| LOCAL | | ○ x 2 | | | ○ x 2 | | |
| Electrical Room | | ○ x 2 | | | ○ x 2 | | |
| MANUAL | | | | | ○ x 2 | | |
| OFF | | | | | ○ x 2 | | |
| STOP | | ○ x 2 | ○ x 2 | | ○ x 2 | | |
| START | | ○ x 2 | ○ x 2 | | ○ x 2 | | |
| DRIVE OPERATION | | | | | | | |
| LOCAL - Elec. Room | COS | ○ x 2 | | | | | |
| MAN - OFF | COS | | ○ x 2 | | | | |
| START - STOP | COS | ○ x 2 | ○ x 2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |
| FAULT | | | | | ○ x 2 | | ○ |
| OVER LOAD | T | ○ x 2 | | | | | |
| OVER CURRENT GROUND | T | ○ x 2 | | | | | |

| | | | | | |
|---------------|------------|----------------|-----------|----------|--------|
| FACILITY NAME | | GRIT CHAMBER | | | |
| TAG No. | S03GP01/02 | EQUIPMENT NAME | GRIT PUMP | CAPACITY | 3.7 Kw |

DRIVE SYSTEM



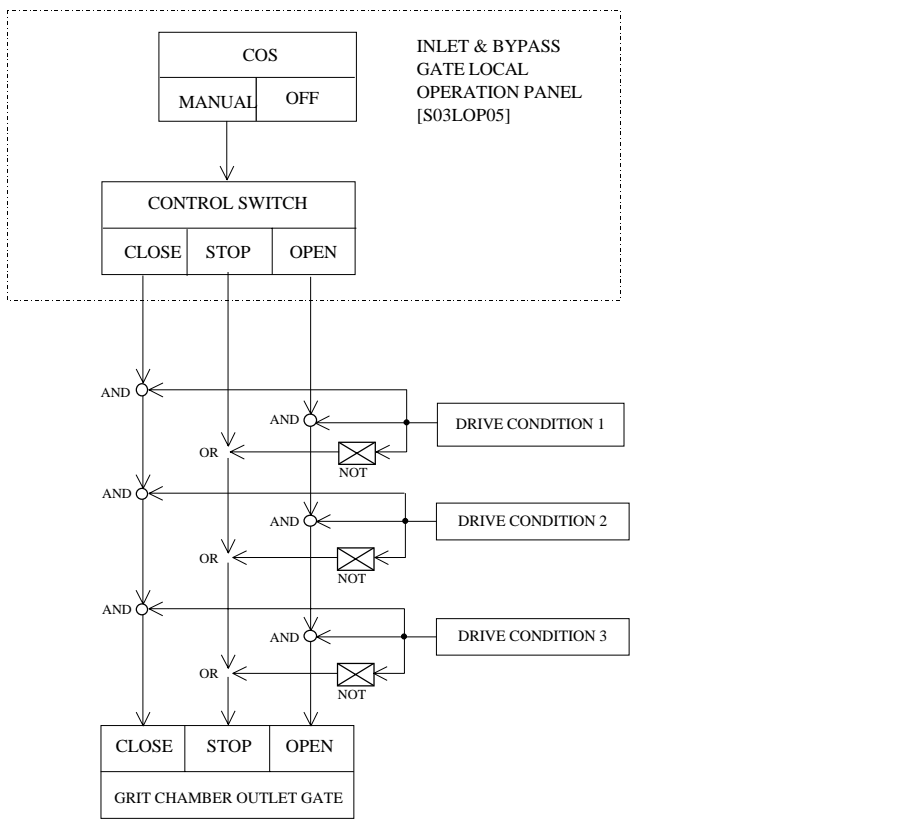
AUTO MODE OPERATION
1. TO OPERATE BASED ON PRE-SET TIMING SEQUENCE

DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|---------------------|----------------|--------------|------------------------------------|---|-----------|----|-------|
| | | LP | MCC | CRT | OPERATION | PR | |
| LOCAL | | ○ x 2 | | | ○ x 2 | | |
| Electrical Room | | ○ x 2 | | | ○ x 2 | | |
| STOP | | ○ x 2 | | | ○ x 2 | | |
| START | | ○ x 2 | | | ○ x 2 | | |
| LOCAL - Elec. Room | COS | ○ x 2 | | | | | |
| START - STOP | COS | ○ x 2 | | | | | |
| FAULT | | | | | ○ x 2 | | ○ x 2 |
| OVER LOAD | T | ○ x 2 | | | | | |
| OVER CURRENT GROUND | T | ○ x 2 | | | | | |

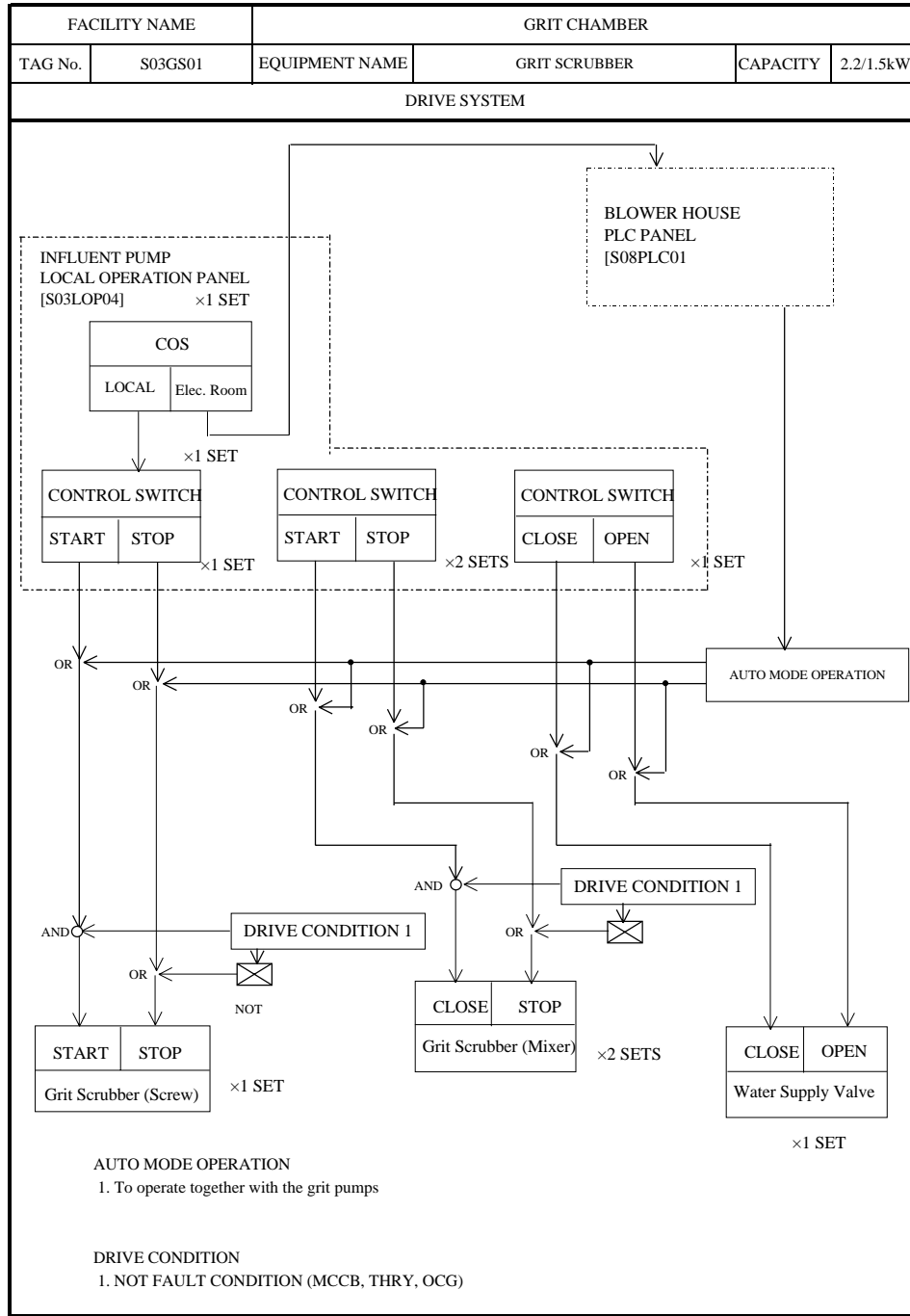
| | | | | | |
|---------------|------------|----------------|--------------------------|----------|--------|
| FACILITY NAME | | GRIT CHAMBER | | | |
| TAG No. | S03MG04/05 | EQUIPMENT NAME | GRIT CHAMBER OUTLET GATE | CAPACITY | 1.5 kW |

DRIVE SYSTEM



- DRIVE CONDITION**
1. OPENING DIRECTIONAL L S (Limit Switch) AND CLOSING DIRECTIONAL LS NOT TO BE ACTUATED DURING OPENING AND CLOSING RESPECTIVELY
 2. OPENING DIRECTIONAL TS (Torque limit switch) AND CLOSING DIRECTIONAL TS NOT TO BE ACTUATED DURING OPENING AND CLOSING RESPECTIVELY
 3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2 F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|---------------------|--------------|--|--|-----------|----|-------|
| | | LP | MCC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | OPEN | | ○ x 2 | | ○ x 2 | | |
| | STOP | | ○ x 2 | | ○ x 2 | | |
| | CLOSE | | ○ x 2 | | ○ x 2 | | |
| DRIVE OPERATION | MAN - OFF | COS | ○ x 2 | | | | |
| | OPEN - STOP - CLOSE | CS | ○ x 2 | | | | |
| | | | | | | | |
| FAULT / ABNORMAL INDICATIONS | FAULT | | | | ○ x 2 | | ○ x 2 |
| | OVER LOAD | T | ○ x 2 | | | | |
| | OVER TORQUE | T | ○ x 2 | | | | |
| | OVER CURRENT GROUND | T | ○ x 2 | | | | |

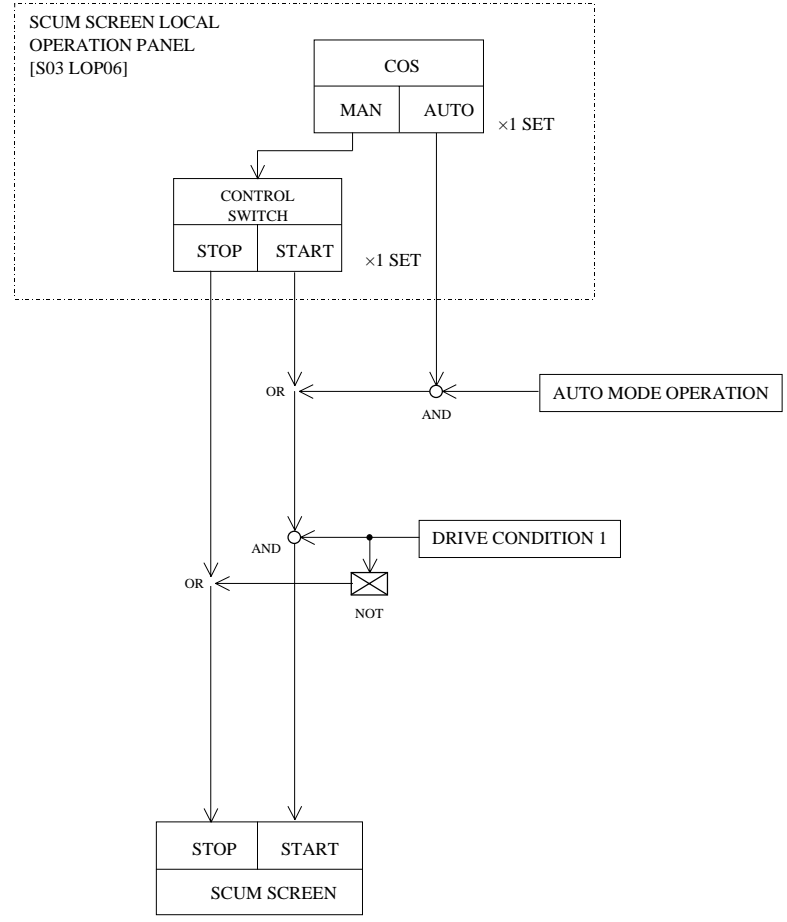


02-32

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--------------|------------------------------------|---|-----------|-----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| LOCAL Electrical Room | | ○ | | | | | |
| START | | ○×3 | | ○×3 | | | |
| STOP | | ○×3 | | ○×3 | | | |
| CLOSE | | ○ | | ○ | | | |
| OPEN | | ○ | | ○ | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| LOCAL -Elec. Room | COS | ○ | | | | | |
| START - STOP | CS | ○×3 | | | | | |
| CLOSE - OPEN | CS | ○ | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○×3 | | ○×3 | |
| OVER LOAD | T | ○×3 | | | | | |
| OVER CURRENT GROUND | T | ○×3 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|----------|----------------|-------------|----------|-------|
| FACILITY NAME | | GRIT CHAMBER | | | |
| TAG No. | S03 SS01 | EQUIPMENT NAME | SCUM SCREEN | CAPACITY | 0.4kW |

DRIVE SYSTEM



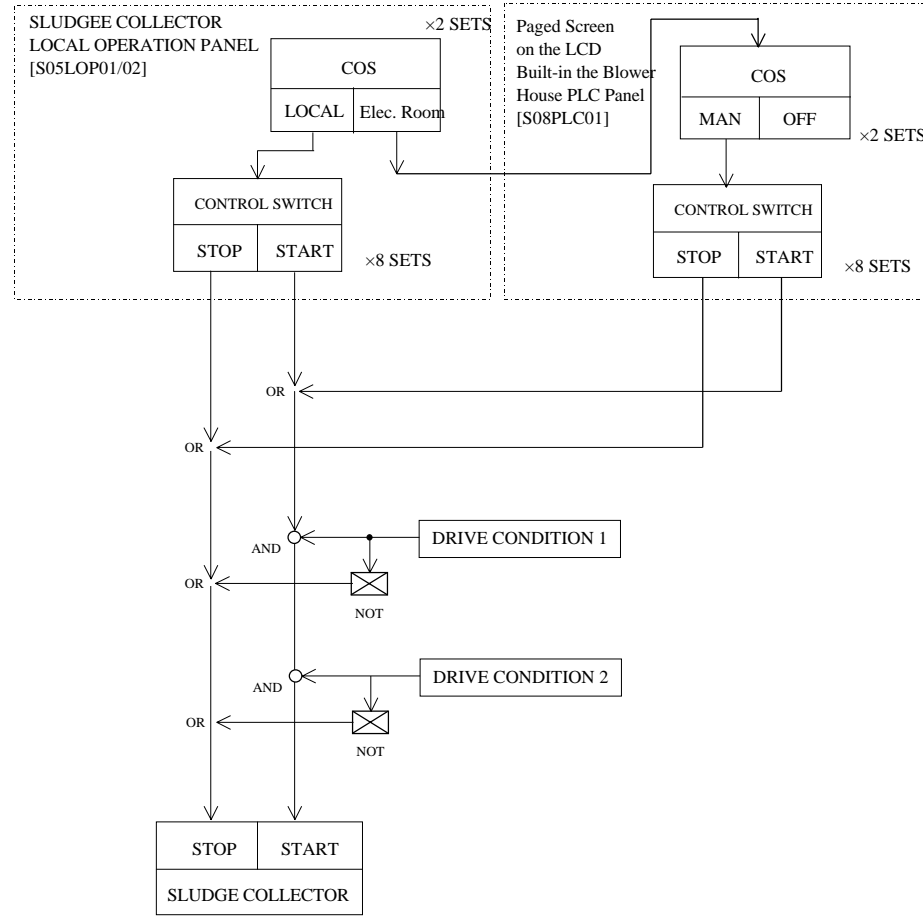
AUTO MODE OPERATION
1. TO OPERATE IN ACCORDANCE WITH THE SCUM PUMPS

DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--------------|------------------------------------|---|-----------|----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | | ○ | | | | | |
| AUTO | | ○ | | | | | |
| STOP | | ○ | | ○ | | | |
| START | | ○ | | ○ | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | ○ | | | | | |
| START - STOP | CS | ○ | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ | | ○ | |
| OVER LOAD | T | ○ | | | | | |
| OVER CURRENT GROUNDING | T | ○ | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

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|---------------|---------------|-----------------------------|-------------------|----------|--------|
| FACILITY NAME | | PRIMARY SEDIMENTATION TANKS | | | |
| TAG No. | S05SC01 to 08 | EQUIPMENT NAME | SLUDGE COLLECTORS | CAPACITY | 1.5 kW |

DRIVE SYSTEM

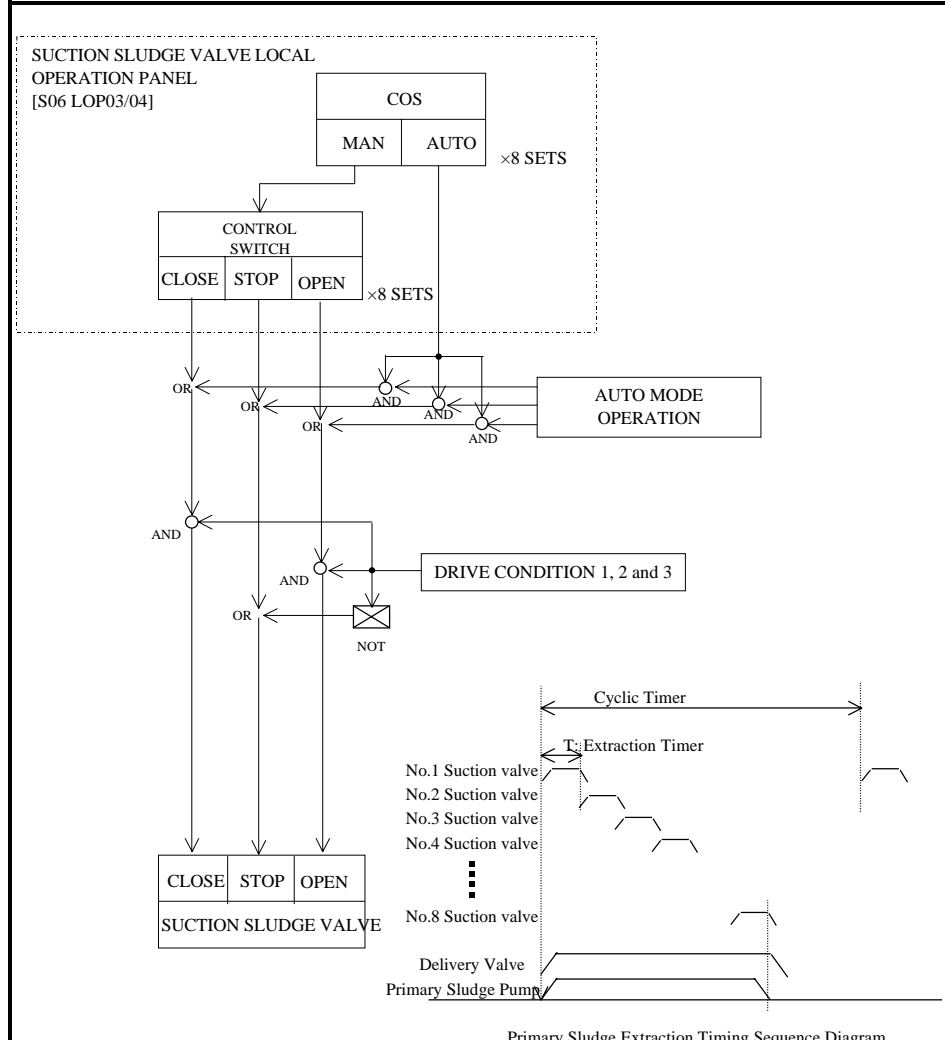


DRIVE CONDITION
 2. TS (Torque limit switch) NOT TO BE ACTUATED
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--------------|------------------------------------|---|-----------|-------|------|
| | | LP | PLC | CRT | OPERATION | PR | |
| LOCAL | | ○ x 2 | | | | | |
| Electrical Room | | ○ x 2 | | | | | |
| MANUAL | | | ○ x 2 | | | | |
| OFF | | | ○ x 2 | | | | |
| STOP | | ○ x 8 | ○ x 8 | ○ x 8 | | | |
| START | | ○ x 8 | ○ x 8 | ○ x 8 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| LOCAL - Elec. Room | COS | ○ x 8 | | | | | |
| MAN - OFF | COS | | ○ x 8 | | | | |
| START - STOP | CS | ○ x 8 | ○ x 8 | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ x 8 | | ○ x 8 | |
| OVER LOAD | T | ○ x 8 | | | | | |
| OVER CURRENT GROUND | T | ○ x 8 | | | | | |
| OVER TORQUE | T | ○ x 8 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|----------------|-----------------------------|-----------------------|----------|-------|
| FACILITY NAME | | PRIMARY SEDIMENTATION TANKS | | | |
| TAG No. | S05 MV01 to 08 | EQUIPMENT NAME | SUCTION SLUDGE VALVES | CAPACITY | 0.4kW |

DRIVE SYSTEM



Primary Sludge Extraction Timing Sequence Diagram

Note: The cyclic timer and the extraction timer shall be adjustable on the paged screen of LCD built-in the blower house PLC.

AUTO MODE OPERATION

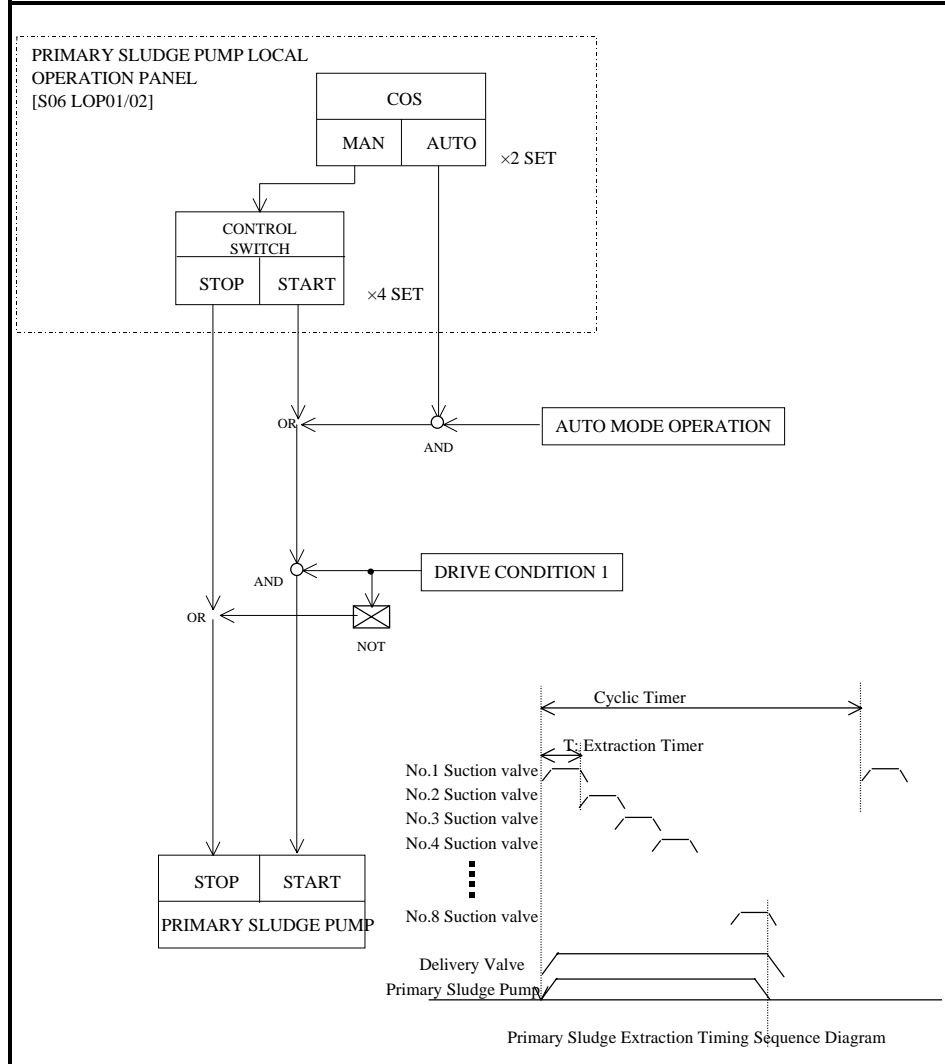
1. To operate based on pre set timing sequence as shown above together with the primary sludge pumps and the deliver valve

- DRIVE CONDITION**
- Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
 - Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
 - NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|---------------------------|------------------------------------|---|---------------------------|----|---------------------------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | | <input type="radio"/> x 8 | | | | | |
| AUTO | | <input type="radio"/> x 8 | | | | | |
| STOP | | <input type="radio"/> x 8 | | | <input type="radio"/> x 8 | | |
| START | | <input type="radio"/> x 8 | | | <input type="radio"/> x 8 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | <input type="radio"/> x 8 | | | | | |
| CLOSE - STOP - OPE | CS | <input type="radio"/> x 8 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | <input type="radio"/> x 8 | | <input type="radio"/> x 8 |
| OVER LOAD | T | <input type="radio"/> x 8 | | | | | |
| OVER CURRENT GROUNDING | T | <input type="radio"/> x 8 | | | | | |
| OVER TORQUE | T | <input type="radio"/> x 8 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|---------------|-----------------------------|----------------------|----------|-------|
| FACILITY NAME | | PRIMARY SEDIMENTATION TANKS | | | |
| TAG No. | S05SP01 to 04 | EQUIPMENT NAME | PRIMARY SLUDGE PUMPS | CAPACITY | 5.5kW |

DRIVE SYSTEM



Note: The cyclic timer and the extraction timer shall be adjustable on the paged screen of LCD built-in the blower house PLC.

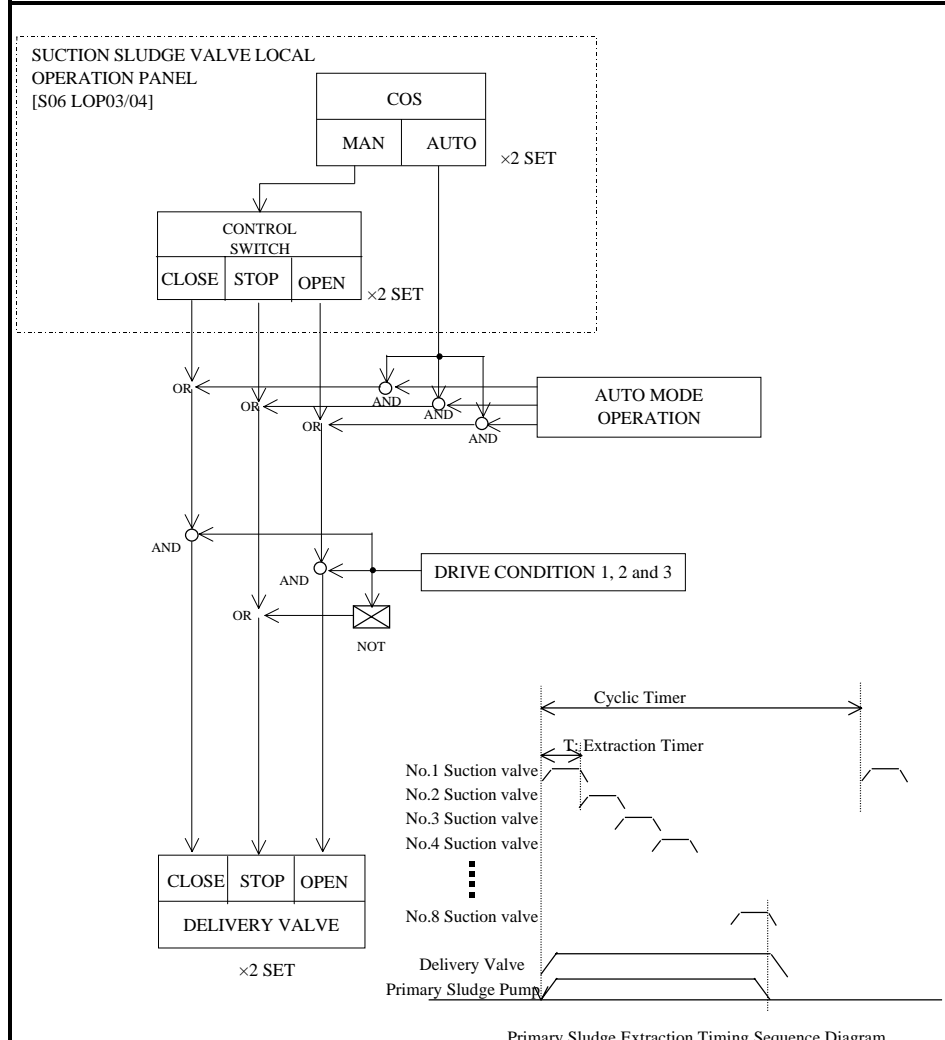
AUTO MODE OPERATION
 1. To operate based on pre set timing sequence as shown above together with the suction sludge valves and the delivery valve.

DRIVE CONDITION
 1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--------------------------------------|----------------|--------------|------------------------------------|---|-----------|----|-------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | | ○ x 4 | | | | | |
| AUTO | | ○ x 4 | | | | | |
| STOP | | ○ x 4 | | | ○ x 4 | | |
| START | | ○ x 4 | | | ○ x 4 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | ○ x 2 | | | | | |
| START - STOP | CS | ○ x 4 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | ○ x 4 | | ○ x 4 |
| OVER LOAD | T | ○ x 4 | | | | | |
| OVER CURRENT GROUNDING | T | ○ x 4 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

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|---------------|-------------|-----------------------------|-----------------|----------|-------|
| FACILITY NAME | | PRIMARY SEDIMENTATION TANKS | | | |
| TAG No. | S05 MV51/61 | EQUIPMENT NAME | DELIVERY VALVES | CAPACITY | 0.4kW |

DRIVE SYSTEM



Primary Sludge Extraction Timing Sequence Diagram

Note: The cyclic timer and the extraction timer shall be adjustable on the paged screen of LCD built-in the blower house PLC.

AUTO MODE OPERATION

1. To operate based on pre set timing sequence as shown above together with the primary sludge pumps and the suction valves.

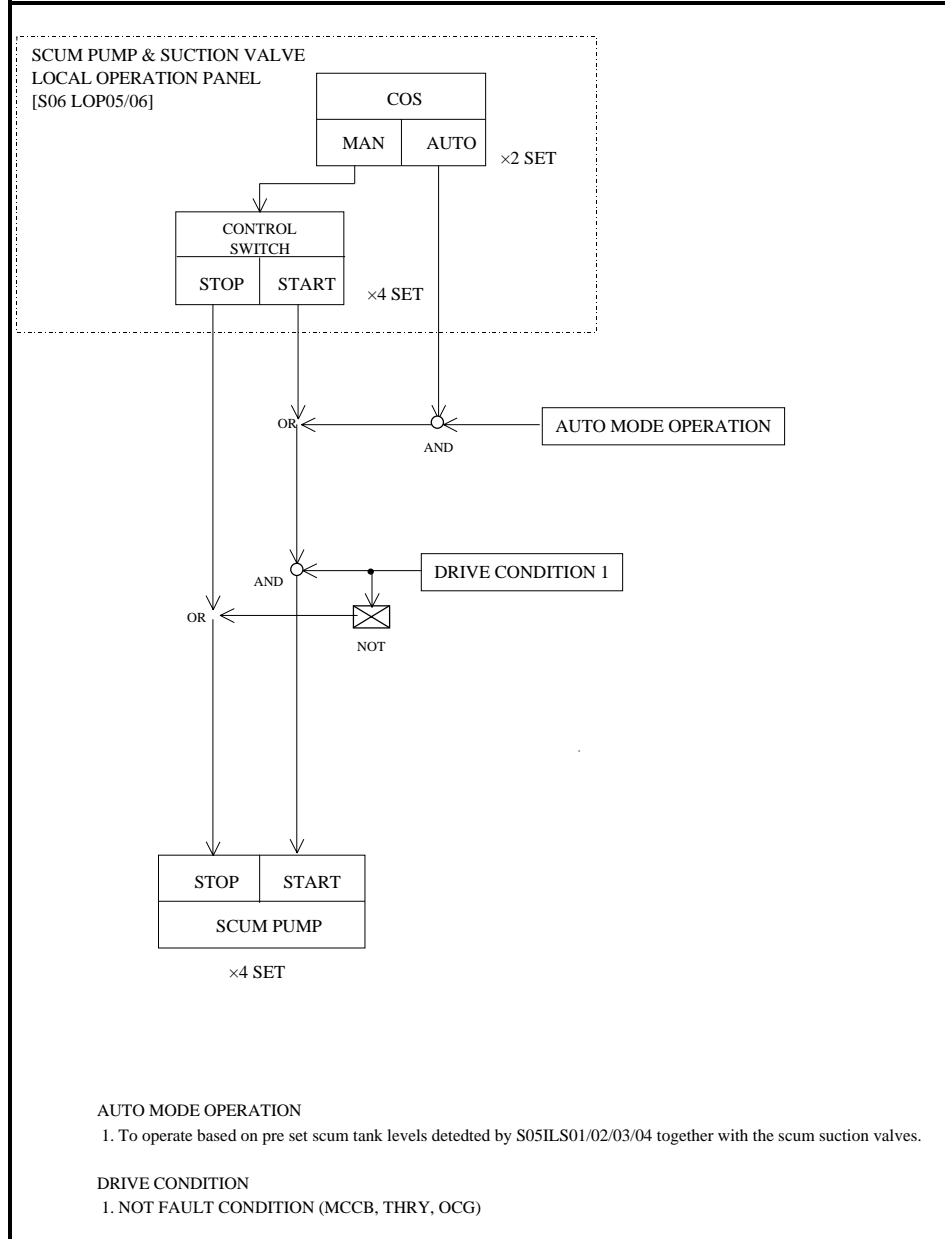
DRIVE CONDITION

- Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
- Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
- NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|------------------------|--------------|------------------------------------|---|-----------|-------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | MANUAL | ○ x 2 | | | | | |
| | AUTO | ○ x 2 | | | | | |
| | STOP | ○ x 2 | | ○ x 2 | | | |
| | START | ○ x 2 | | ○ x 2 | | | |
| DRIVE OPERATION | MAN - AUTO | ○ x 2 | | | | | |
| | COS | ○ x 2 | | | | | |
| FAULT / ABNORMAL INDICATIONS | FAULT | | | ○ x 2 | | ○ x 2 | |
| | OVER LOAD | T | ○ x 2 | | | | |
| | OVER CURRENT GROUNDING | T | ○ x 2 | | | | |
| | OVER TORQUE | T | ○ x 2 | | | | |
| | | | | | | | |

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|---------------|---------------|-----------------------------|------------|----------|-------|
| FACILITY NAME | | PRIMARY SEDIMENTATION TANKS | | | |
| TAG No. | S05SP05 to 08 | EQUIPMENT NAME | SCUM PUMPS | CAPACITY | 3.7kW |

DRIVE SYSTEM

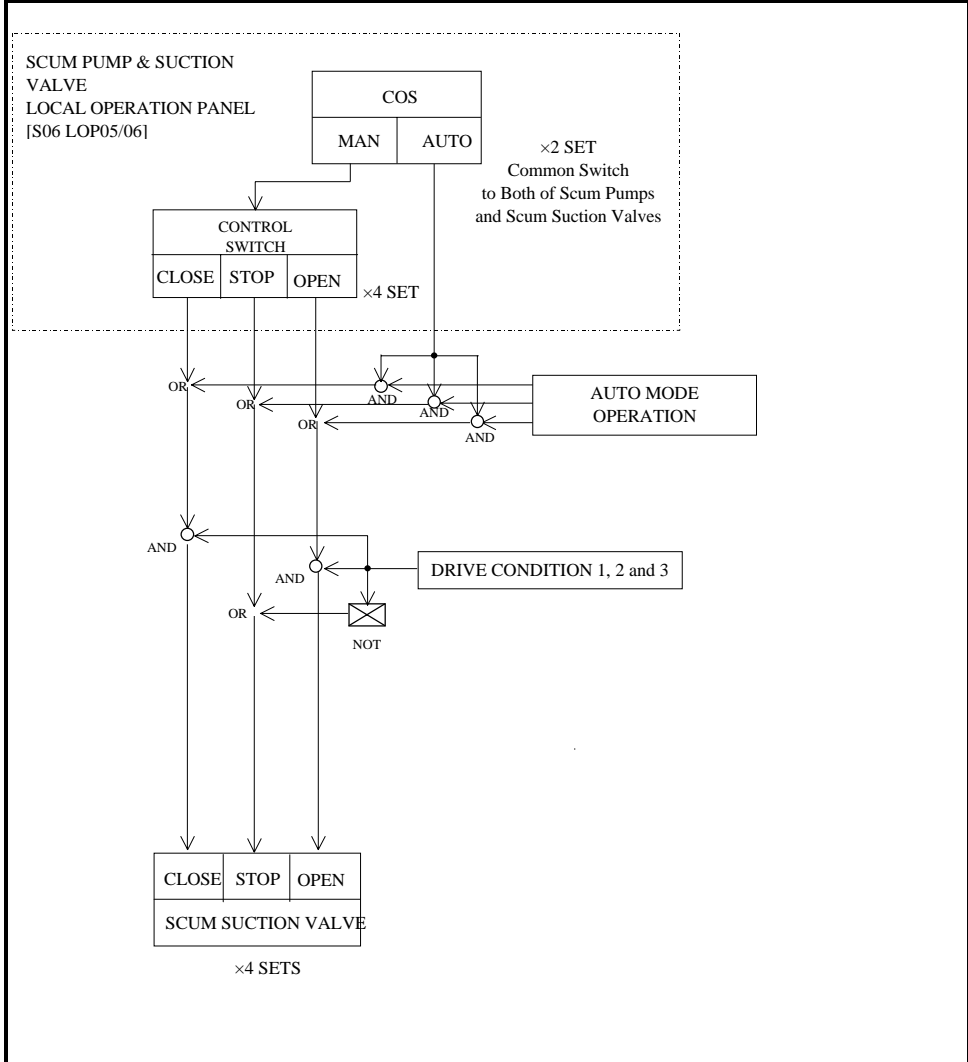


C2-38

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--------------|------------------------------------|---|-----------|-------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | | ○ x 2 | | | | | |
| AUTO | | ○ x 2 | | | | | |
| STOP | | ○ x 4 | | ○ x 4 | | | |
| START | | ○ x 4 | | ○ x 4 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | ○ x 2 | | | | | |
| START - STOP | CS | ○ x 4 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ x 4 | | ○ x 4 | |
| OVER LOAD | T | ○ x 4 | | | | | |
| OVER CURRENT GROUNDING | T | ○ x 4 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

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|---------------|-------------|-----------------------------|---------------------|----------|-------|
| FACILITY NAME | | PRIMARY SEDIMENTATION TANKS | | | |
| TAG No. | S05 MV11/41 | EQUIPMENT NAME | SCUM SUCTION VALVES | CAPACITY | 0.2kW |

DRIVE SYSTEM



AUTO MODE OPERATION
1. To operate together with the scum pumps.

DRIVE CONDITION
1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|------------------------|----------------|--|------------------------------------|---|-----------|-------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | } | | | | | | |
| AUTO | | COMMON SWITCH TO BOTH OF SCUM PUMPS AND SCUM SUCTION VALVE | | | | | |
| CLOSE | | ○ x 4 | | ○ x 4 | | | |
| STOP | | ○ x 4 | | ○ x 4 | | | |
| OPEN | | ○ x 4 | | ○ x 4 | | | |
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| CLOSE - STOP - OPE CS | | ○ x 4 | | | | | |
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| FAULT | | | | ○ x 4 | | ○ x 4 | |
| OVER LOAD | T | | ○ x 4 | | | | |
| OVER CURRENT GROUNDING | T | | ○ x 4 | | | | |
| OVER TORQUE | T | | ○ x 4 | | | | |
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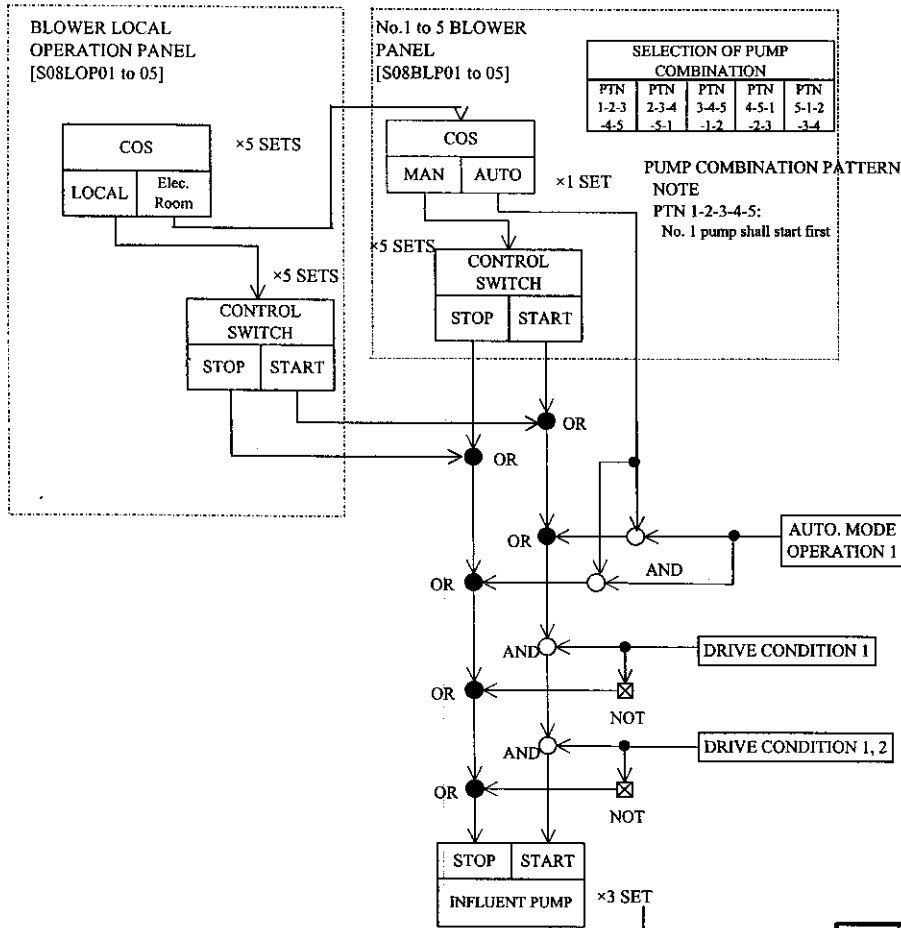
DRIVE / CONDITION INDICATIONS

DRIVE OPERATION

FAULT / ABNORMAL INDICATIONS

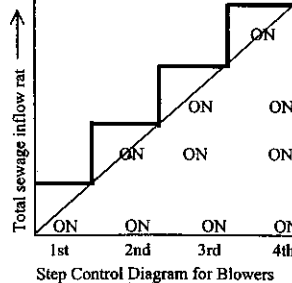
| | | | | | |
|---------------|---------------|----------------|---------|----------|--------|
| FACILITY NAME | | BLOWER HOUSE | | | |
| TAG No. | S08AB01 to 05 | EQUIPMENT NAME | BLOWERS | CAPACITY | 315 kW |

DRIVE SYSTEM



AUTO MODE OPERATION
 1. Step control according to total sewage inflow rate detected by S08IFE01/02/03/0

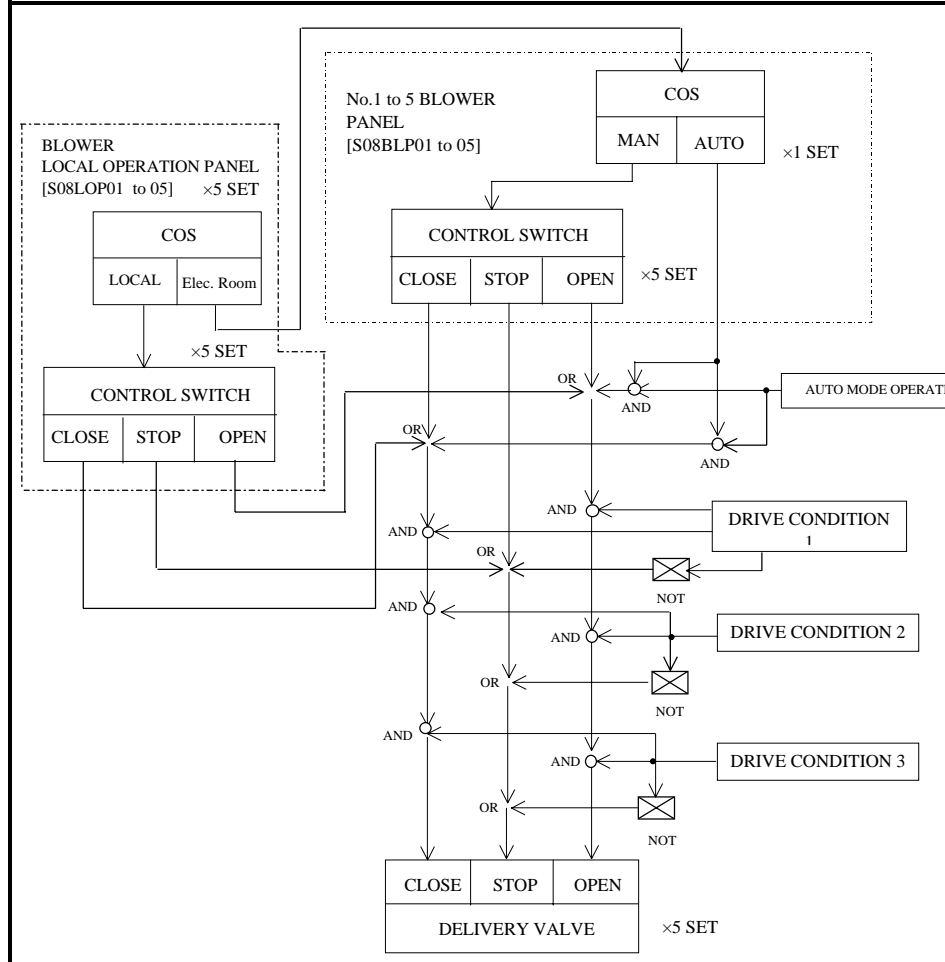
DRIVE CONDITION
 1. NOT FAULT CONDITION (MCCB, THRY, OCG)
 2. BLOWER NOT FAULT



| ITEM | STOP CONDITION | LOCAL (SITE) | HIGH VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------|----------------|--------------|------------------------------|---|-----------|-----|------|
| | | LP | BLOWER PANEL | CRT | OPERATION | PR | |
| MANUAL | | | ○×5 | | | | |
| AUTO | | | ○×5 | | | | |
| LOCAL | | ○×5 | | | | | |
| REMOTE | | ○×5 | | | | | |
| START | | ○×5 | ○×5 | ○×5 | | | |
| STOP | | ○×5 | ○×5 | ○×5 | | | |
| MANUAL - AUTO | COS | | ○×1 | | | | |
| LOCAL - Electrical Room | COS | ○×5 | | | | | |
| START - STOP | CS | ○×5 | ○×5 | | | | |
| FAULT | | | | ○×5 | | ○×5 | |
| OVER LOAD | T | ○×5 | ○×5 | | | | |
| OVER CURENT GROUNDIN | T | ○×5 | ○×5 | | | | |
| BLOWER FAULT | T | ○×5 | ○×5 | | | | |

| | | | | | |
|---------------|---------------|----------------|-----------------|----------|-----------|
| FACILITY NAME | | BLOWER HOUSE | | | |
| TAG No. | S08MV01 to 05 | EQUIPMENT NAME | DELIVERY VALVES | CAPACITY | 3.7/1.5kW |

DRIVE SYSTEM



AUTO MODE OPERATION
 1. To open or close following the start or the stop of the relevant blower respectively with some time lag.

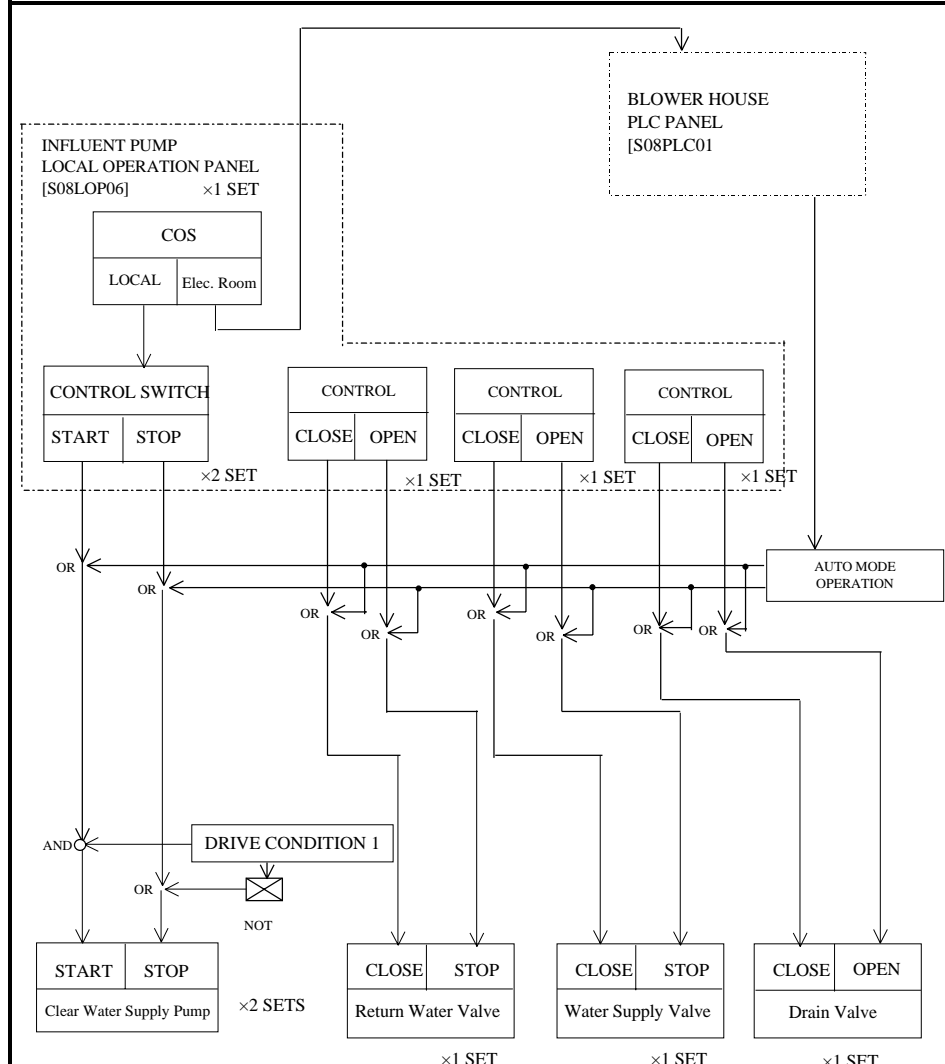
DRIVE CONDITION
 1. OPENING DIRECTIONAL L S (Limit Switch) AND CLOSING DIRECTIONAL LS NOT TO BE ACTUATED FOR OPENING AND CLOSING ACTION RESPECTIVELY
 2. OPENING DIRECTIONAL TS (Torque limit switch) AND CLOSING DIRECTIONAL TS NOT TO BE ACTUATED FOR OPENING AND CLOSING ACTION RESPECTIVELY
 3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | HIGH VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--------------------------------------|----------------|--------------|------------------------------|---|-----------|-----|------|
| | | LP | BLOWER PANELS | CRT | OPERATION | PR | |
| AUTO | | | | | | | |
| MANUAL | | | | | | | |
| LOCAL | | | | | | | |
| REMOTE | | | | | | | |
| CLOSE | | ○×5 | ○×5 | ○×5 | | | |
| STOP | | ○×5 | ○×5 | ○×5 | | | |
| OPEN | | ○×5 | ○×5 | ○×5 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | | | | | | |
| LOCAL - Electrical Room | COS | | | | | | |
| CLOSE - STOP - OPEN CS | | ○×5 | ○×5 | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○×5 | | ○×5 | |
| OVER LOAD | T | ○×5 | ○×5 | | | | |
| OVER TORQUE | T | ○×5 | ○×5 | | | | |
| OVER CURRENT GROUND | T | ○×5 | ○×5 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

C2-41

| | | | | | |
|---------------|------------|----------------|-------------------------|----------|-----------|
| FACILITY NAME | | GRIT CHAMBER | | | |
| TAG No. | S08WP01/02 | EQUIPMENT NAME | CLEAR WATER SUPPLY PUMP | CAPACITY | 2.2/1.5kW |

DRIVE SYSTEM



AUTO MODE OPERATION
 1. The clear water supply pump shall operate together with air blowers.
 2. When the water temperature in the clear water tank rises to pre-set degree, the return water valve shall close meanwhile the water supply valve and the drain valve shall open.

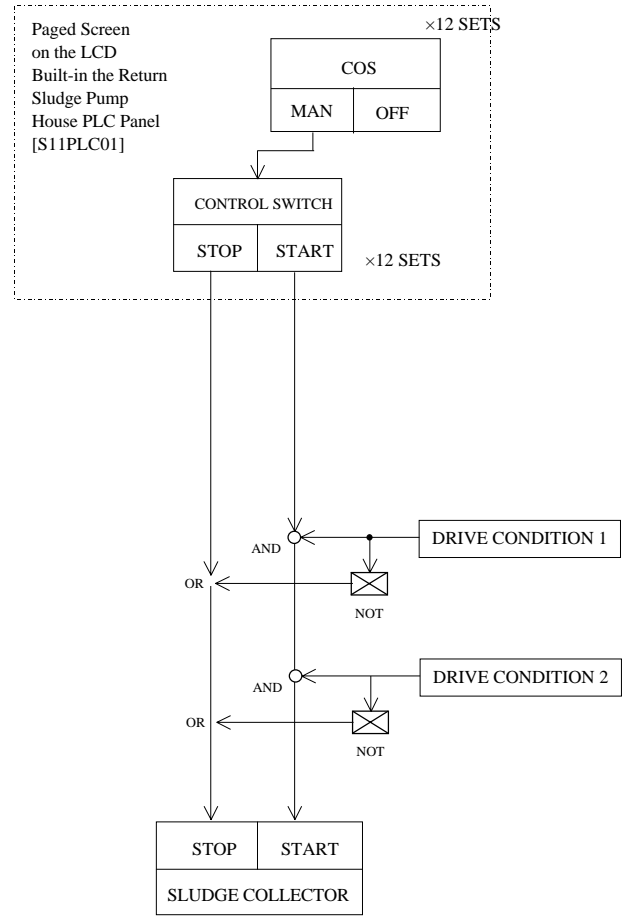
DRIVE CONDITION
 1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|------------------------|----------------|---------------------------|------------------------------------|---|-----------|-----------------------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| LOCAL Electrical Room | | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | | |
| START | | <input type="radio"/> × 2 | | <input type="radio"/> | | | |
| STOP | | <input type="radio"/> × 2 | | <input type="radio"/> | | | |
| CLOSE | | <input type="radio"/> × 3 | | <input type="radio"/> | | | |
| OPEN | | <input type="radio"/> × 3 | | <input type="radio"/> | | | |
| LOCAL - Elec. Room COS | | <input type="radio"/> | | | | | |
| START - STOP CS | | <input type="radio"/> | | | | | |
| CLOSE - OPEN CS | | <input type="radio"/> × 3 | | | | | |
| FAULT | | | | <input type="radio"/> | | <input type="radio"/> | |
| OVER LOAD | T | <input type="radio"/> | | | | | |
| OVER CURRENT GROUND | T | <input type="radio"/> | | | | | |

C2-42

| | | | | | |
|---------------|--------------|-------------------------------|-------------------|----------|--------|
| FACILITY NAME | | SECONDARY SEDIMENTATION TANKS | | | |
| TAG No. | S12SC01 to12 | EQUIPMENT NAME | SLUDGE COLLECTORS | CAPACITY | 1.5 kW |

DRIVE SYSTEM

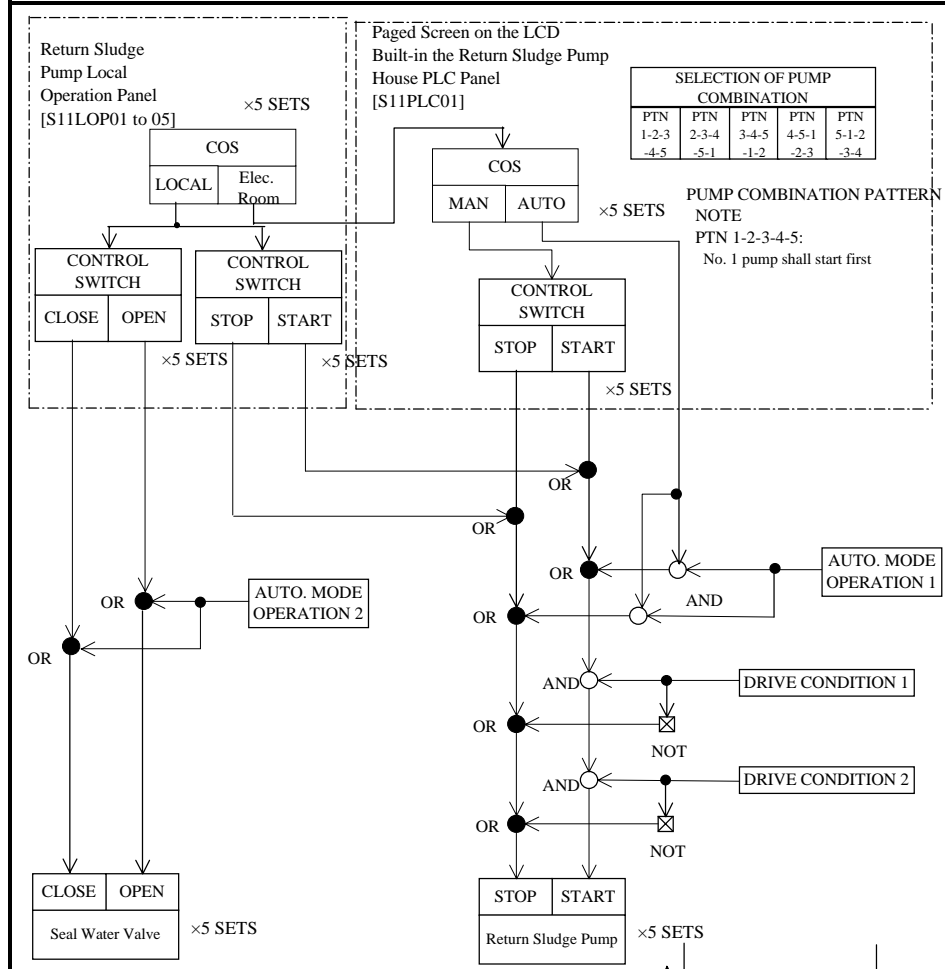


DRIVE CONDITION
 2. TS (Torque limit switch) NOT TO BE ACTUATED
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | BLOWER HOUSE 2F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|---------------------|--------------|------------------------------------|---|-----------|--------|------|
| | | LP | PLC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | MANUAL | | ○ x 12 | | | | |
| | OFF | | ○ x 12 | | | | |
| | STOP | | ○ x 12 | ○ x 12 | | | |
| | START | | ○ x 12 | ○ x 12 | | | |
| DRIVE OPERATION | MAN - OFF | COS | ○ x 12 | | | | |
| | START - STOP | COS | ○ x 12 | | | | |
| | | | | | | | |
| | | | | | | | |
| FAULT / ABNORMAL INDICATIONS | FAULT | | | ○ x 12 | | ○ x 12 | |
| | OVER LOAD | T | ○ x 12 | | | | |
| | OVER CURRENT GROUND | T | ○ x 12 | | | | |
| | OVER TORQUE | T | ○ x 12 | | | | |

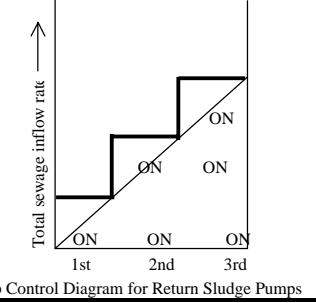
| | | | | | |
|---------------|---------------|--------------------------|---------------------|----------|--------|
| FACILITY NAME | | RETURN SLUDGE PUMP HOUSE | | | |
| TAG No. | S11SP01 to 05 | EQUIPMENT NAME | RETURN SLUDGE PUMPS | CAPACITY | 55 k W |

DRIVE SYSTEM



AUTO MODE OPERATION
 1. Step control according to total sewage inflow rate detected by S08IFE01/02/03/4
 2. To operate together with the relevant return sludge pump.

DRIVE CONDITION
 1. SEAL WATER VALVE OPEN.
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)



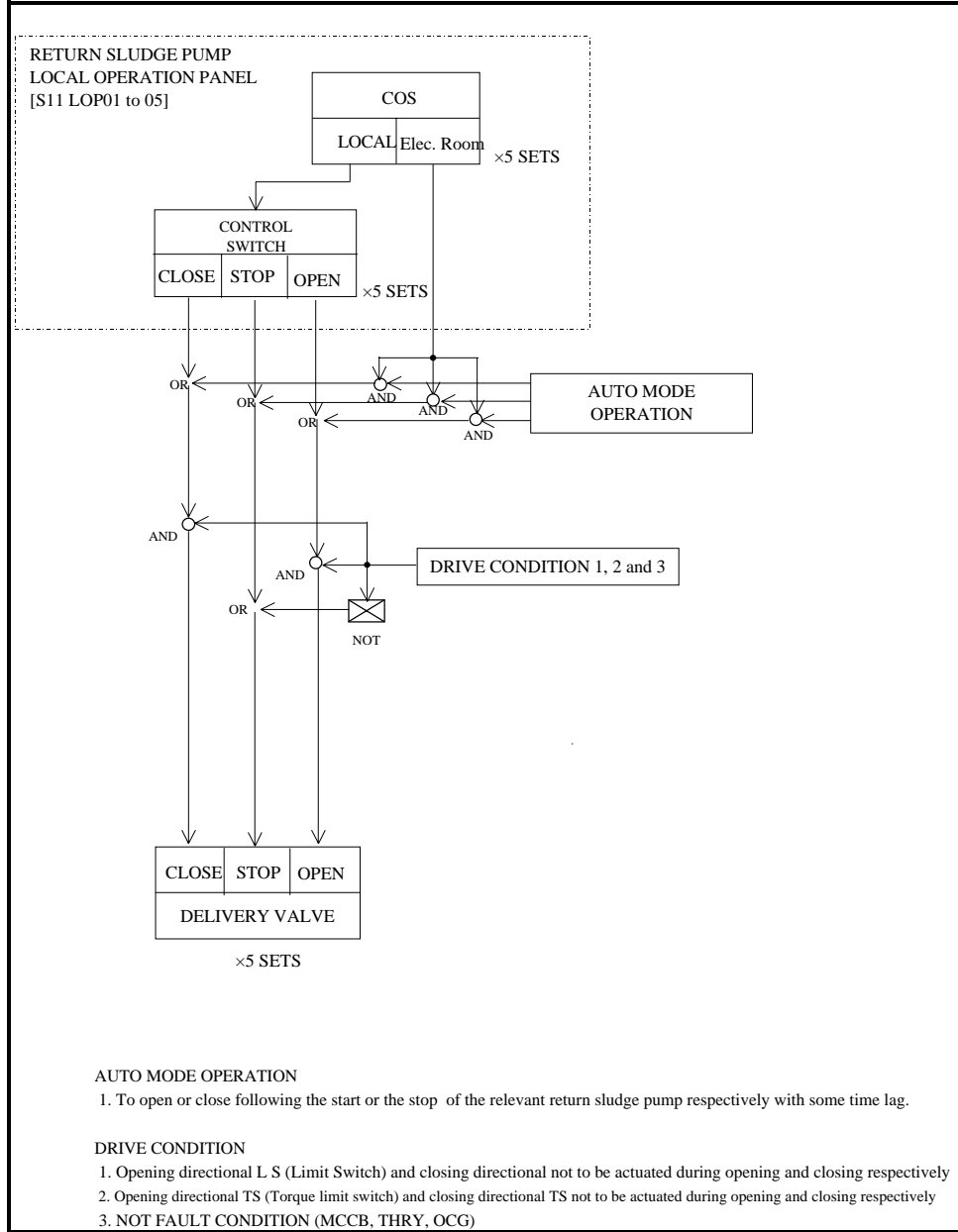
Step Control Diagram for Return Sludge Pumps

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|----------------------|----------------|--------------|------------------------------|---|-----------|-----|------|
| | | LP | RETURN SLUDGE PUMP HOUSE PLC | CRT | OPERATION | PR | |
| MANUAL | | | ○×5 | | | | |
| AUTO | | | ○×5 | | | | |
| START | | | ○×5 | ○×5 | | | |
| STOP | | | ○×5 | ○×5 | | | |
| MANUAL - AUTO | COS | | ○×5 | | | | |
| START - STOP | CS | | ○×5 | | | | |
| FAULT | | | | ○×5 | | ○×5 | |
| OVER LOAD | T | | ○×5 | | | | |
| OVER CURENT GROUNDIN | T | | ○×5 | | | | |
| NO SEAL WATER | T | | ○×5 | | | | |

C2-44

| | | | | | |
|---------------|----------------|--------------------------|-----------------|----------|--------|
| FACILITY NAME | | RETURN SLUDGE PUMP HOUSE | | | |
| TAG No. | S11 MV01 to 05 | EQUIPMENT NAME | DELIVERY VALVES | CAPACITY | 0.75kW |

DRIVE SYSTEM



| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--------------------------|----------------|---|-----------------|---|---------------------------|---------------------------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| LOCAL Electrical Room | | COMMON SWITCH TO BOTH RETURN SLUDGE PUMPS AND DELIVERY VALVES | | | | | |
| CLOSE | | <input type="radio"/> x 5 | | | <input type="radio"/> x 5 | | |
| STOP | | <input type="radio"/> x 5 | | | <input type="radio"/> x 5 | | |
| OPEN | | <input type="radio"/> x 5 | | | | | |
| LOCAL - Elec. Room - COS | | COMMON SWITCH TO BOTH RETURN SLUDGE PUMPS AND DELIVERY VALVES | | | | | |
| CLOSE - STOP - OPE CS | | <input type="radio"/> x 5 | | | | | |
| FAULT | | | | <input type="radio"/> x 5 | | <input type="radio"/> x 5 | |
| OVER LOAD | T | <input type="radio"/> x 5 | | | | | |
| OVER CURRENT GROUNDING | T | <input type="radio"/> x 5 | | | | | |
| OVER TORQUE | T | <input type="radio"/> x 5 | | | | | |

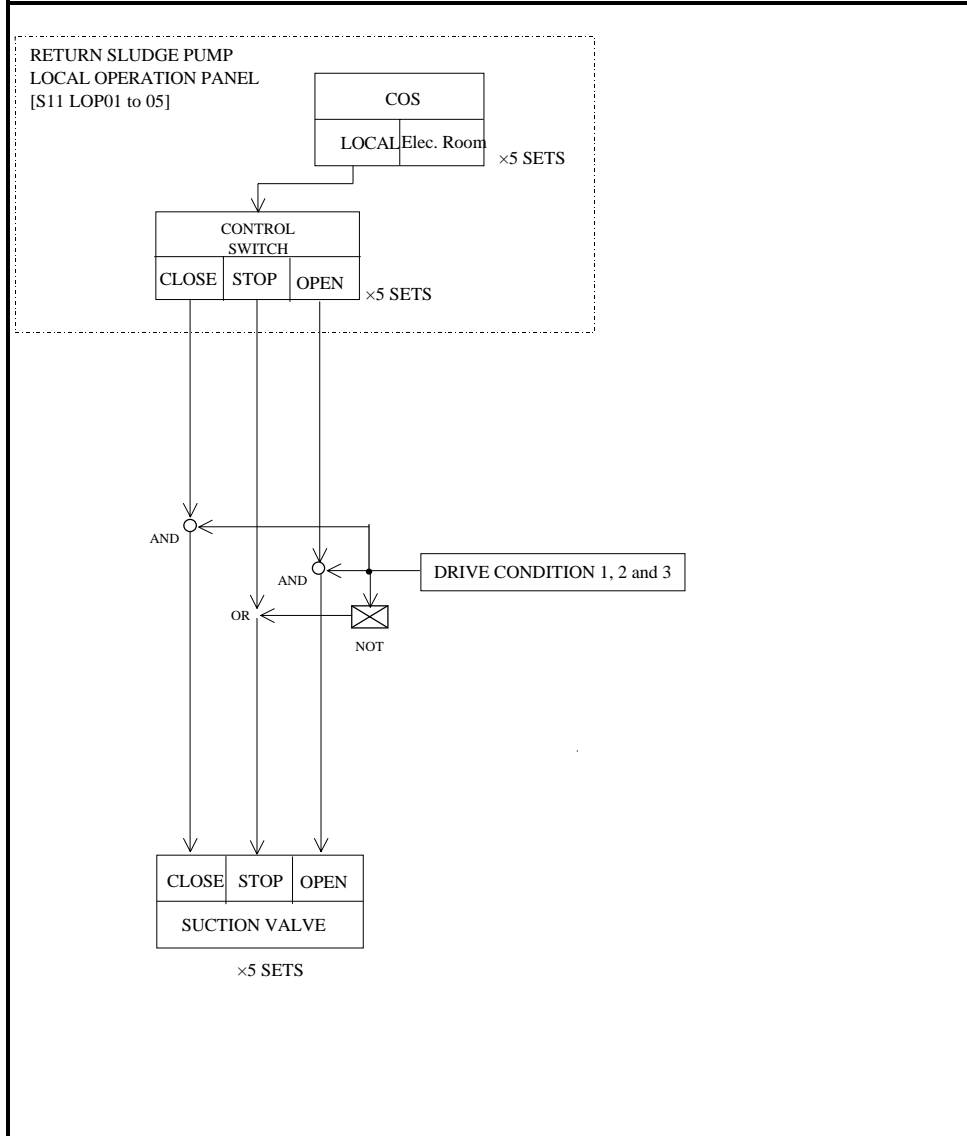
DRIVE / CONDITION INDICATIONS

DRIVE OPERATION

FAULT / ABNORMAL INDICATIONS

| | | | | | |
|---------------|----------------|--------------------------|----------------|----------|--------|
| FACILITY NAME | | RETURN SLUDGE PUMP HOUSE | | | |
| TAG No. | S11 MV01 to 05 | EQUIPMENT NAME | SUCTION VALVES | CAPACITY | 0.75kW |

DRIVE SYSTEM



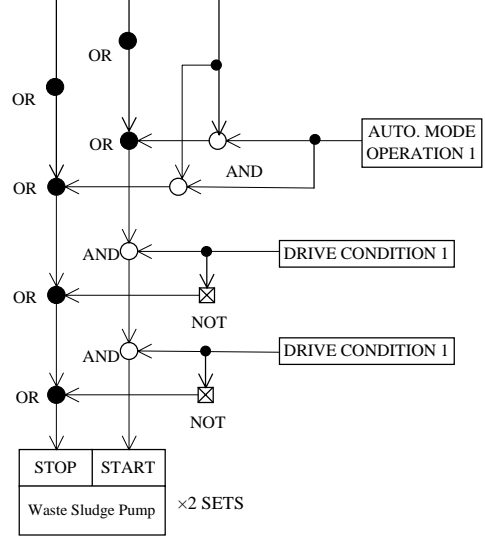
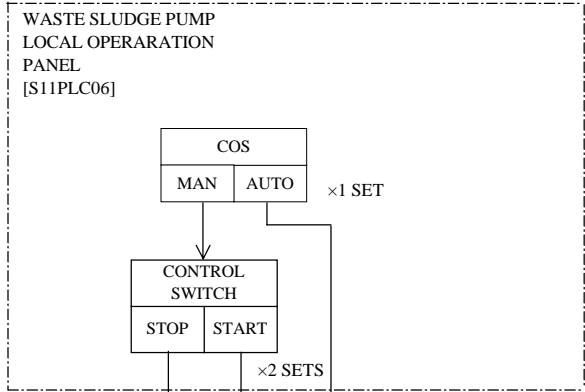
DRIVE CONDITION

1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--|-----------------|---|---------------------------|----|---------------------------|
| | | LP | MCC | CRT | OPERATION | PR | |
| LOCAL Electrical Room | | COMMON SWITCH TO BOTH RETURN SLUDGE PUMPS AND SUCTION VALVES | | | | | |
| CLOSE | | <input type="radio"/> x 5 | | | <input type="radio"/> x 5 | | |
| STOP | | <input type="radio"/> x 5 | | | <input type="radio"/> x 5 | | |
| OPEN | | <input type="radio"/> x 5 | | | <input type="radio"/> x 5 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| LOCAL - Elec. Room - COS | | COMMON SWITCH TO BOTH RETURN SLUDGE PUMPS AND SUCTION VALVES | | | | | |
| CLOSE - STOP - OPE CS | | <input type="radio"/> x 5 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | <input type="radio"/> x 5 | | <input type="radio"/> x 5 |
| OVER LOAD | T | <input type="radio"/> x 5 | | | | | |
| OVER CURRENT GROUNDING | T | <input type="radio"/> x 5 | | | | | |
| OVER TORQUE | T | <input type="radio"/> x 5 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|---------------|--------------------------|--------------------|----------|--------|
| FACILITY NAME | | RETURN SLUDGE PUMP HOUSE | | | |
| TAG No. | S11SP01 to 05 | EQUIPMENT NAME | WASTE SLUDGE PUMPS | CAPACITY | 55 k W |

DRIVE SYSTEM



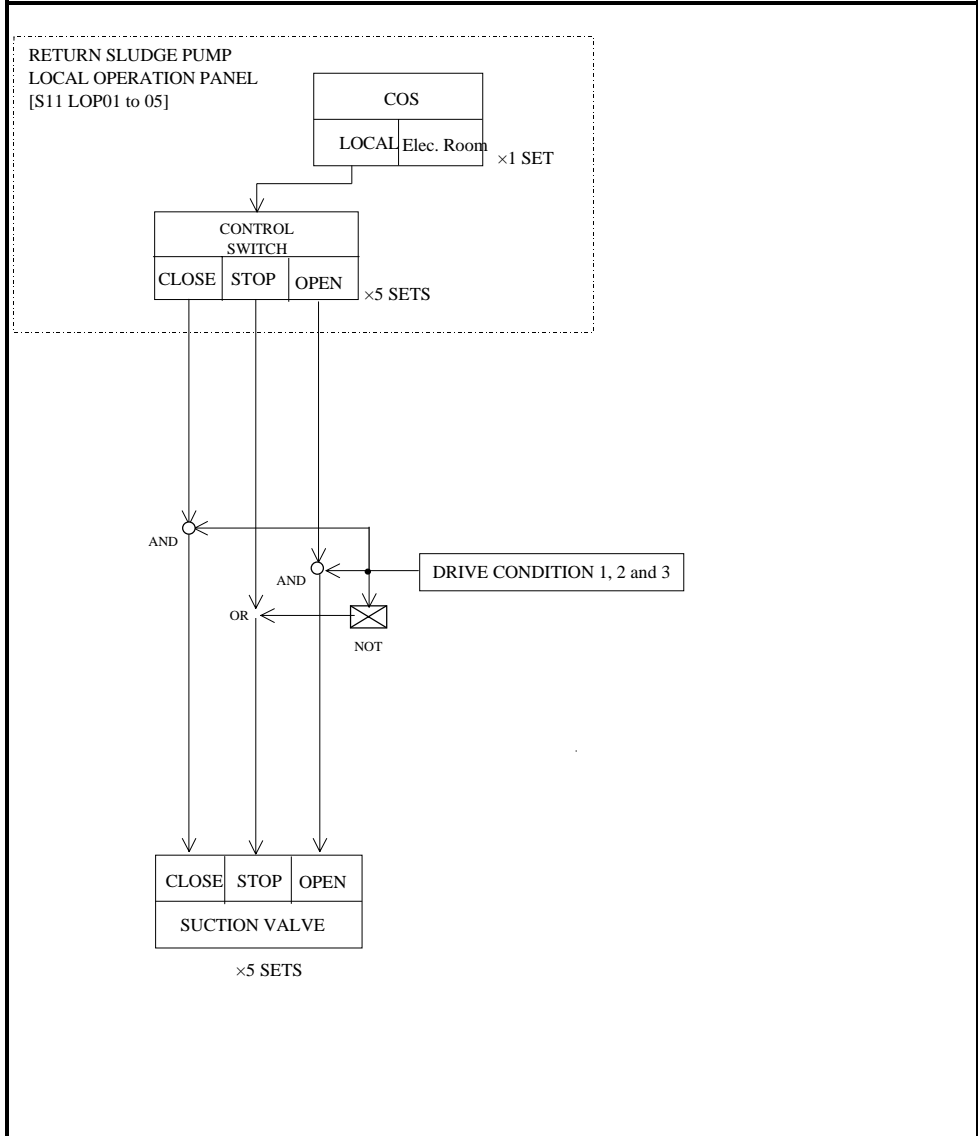
AUTO MODE OPERATION
1. To operate based on pre-set timing sequence.

DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|----------------------|----------------|--------------|------------------------------|---|-----------|-----|------|
| | | LP | RETURN SLUDGE PUMP HOUSE PLC | CRT | OPERATION | PR | |
| MANUAL | | ○ | | | | | |
| AUTO | | ○ | | | | | |
| START | | ○×2 | | ○×2 | | | |
| STOP | | ○×2 | | ○×2 | | | |
| MANUAL - AUTO | COS | ○ | | | | | |
| No.1 - AUTO - No.2 | COS | ○ | | | | | |
| START - STOP | CS | ○×2 | | | | | |
| FAULT | | | | ○×2 | | ○×2 | |
| OVER LOAD | T | | ○×2 | | | | |
| OVER CURENT GROUNDIN | T | | ○×2 | | | | |

| | | | | | |
|---------------|----------------|--------------------------|----------------|----------|--------|
| FACILITY NAME | | RETURN SLUDGE PUMP HOUSE | | | |
| TAG No. | S11 MV01 to 05 | EQUIPMENT NAME | SUCTION VALVES | CAPACITY | 0.75kW |

DRIVE SYSTEM



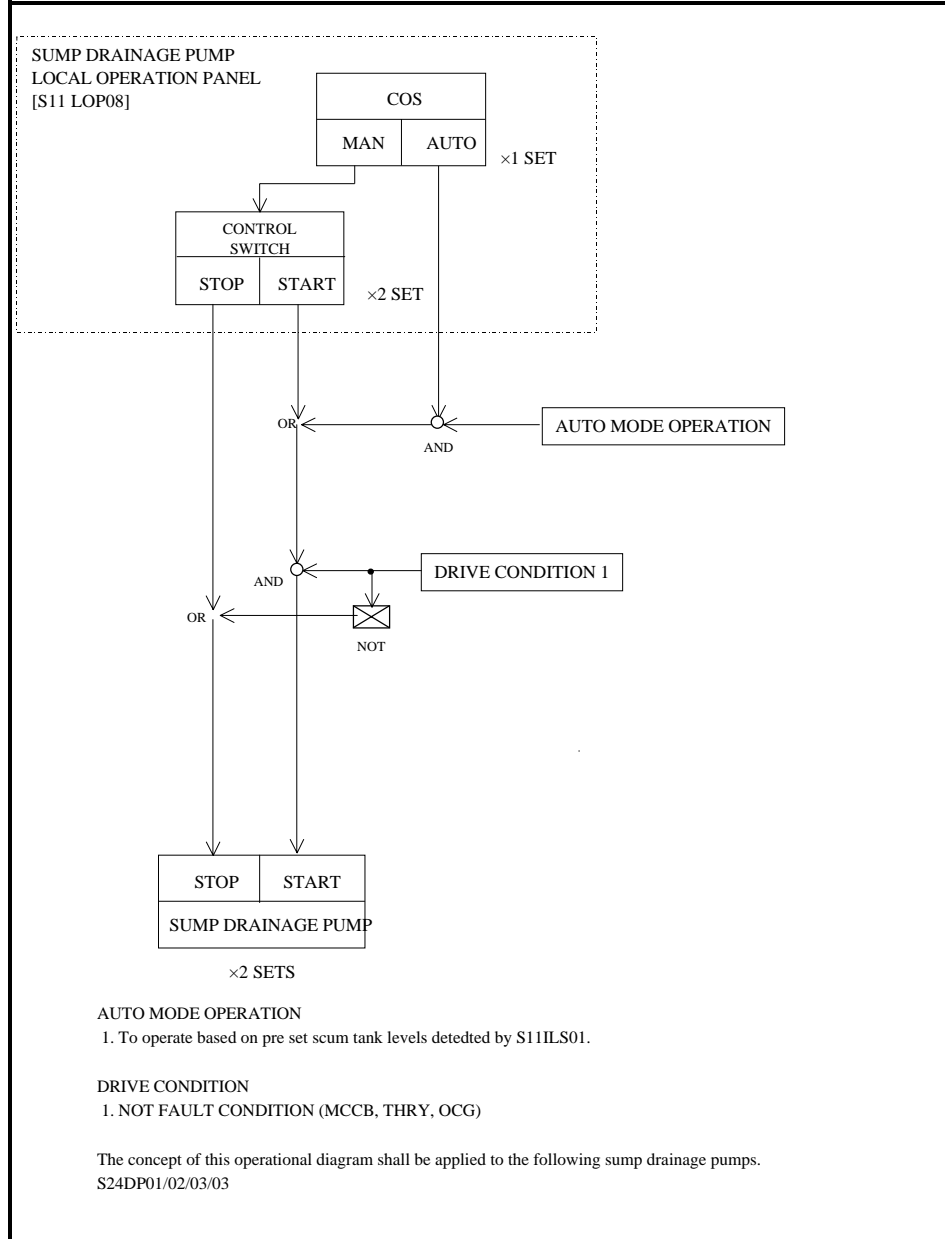
- DRIVE CONDITION**
- Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
 - Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
 - NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--------------------------------------|----------------|--------------|-----------------|---|-----------|-------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| LOCAL | | ○ | | | | | |
| Electrical Room | | ○ | | | | | |
| CLOSE | | ○ x 5 | | ○ x 5 | | | |
| STOP | | ○ x 5 | | ○ x 5 | | | |
| OPEN | | ○ x 5 | | ○ x 5 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| LOCAL - Elec. Room | | ○ | | | | | |
| CLOSE - STOP - OPE | | ○ x 5 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ x 5 | | ○ x 5 | |
| OVER LOAD | T | ○ x 5 | | | | | |
| OVER CURRENT GROUNDING | T | ○ x 5 | | | | | |
| OVER TORQUE | T | ○ x 5 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

C2-48

| | | | | | |
|---------------|------------|--------------------------|---------------------|----------|-------|
| FACILITY NAME | | RETURN SLUDGE PUMP HOUSE | | | |
| TAG No. | S11DP01/02 | EQUIPMENT NAME | SUMP DRAINAGE PUMPS | CAPACITY | 1.5kW |

DRIVE SYSTEM

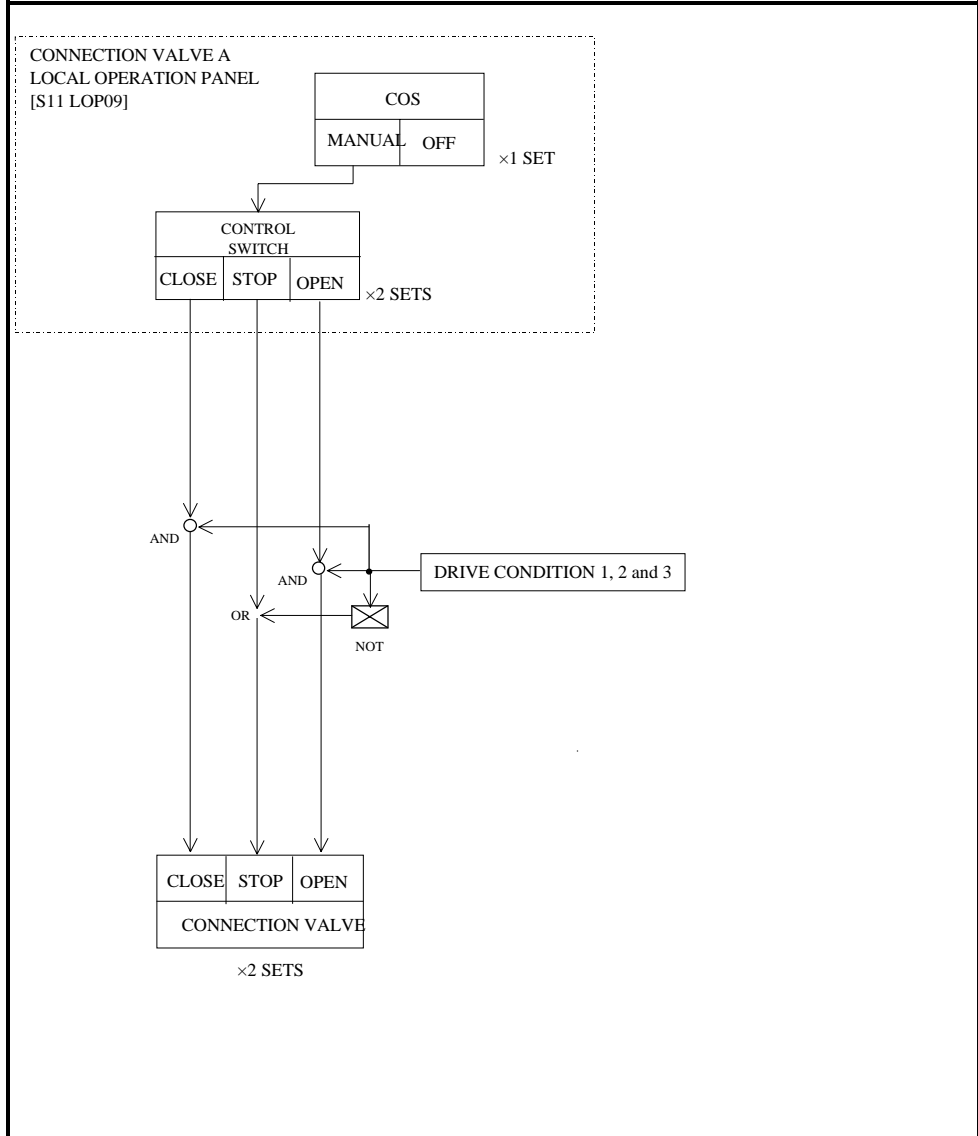


C2-49

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--------------------------------------|----------------|--------------|-----------------|---|-----------|-------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MANUAL | | ○ | | | | | |
| AUTO | | ○ | | | | | |
| No.1 | | ○ | | | | | |
| AUTO | | ○ | | | | | |
| No.2 | | ○ | | | | | |
| STOP | | ○ x 2 | | ○ x 2 | | | |
| START | | ○ x 2 | | ○ x 2 | | | |
| DRIVE OPERATION | | | | | | | |
| MAN - AUTO | COS | ○ | | | | | |
| No.1 - AUTO - No.2 | CS | ○ x 2 | | | | | |
| START - STOP | CS | ○ x 2 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |
| FAULT | | | | ○ x 2 | | ○ x 2 | |
| OVER LOAD | T | ○ x 2 | | | | | |
| OVER CURRENT GROUNDING | T | ○ x 2 | | | | | |

| | | | | | |
|---------------|----------------|--------------------------|---------------------|----------|-------|
| FACILITY NAME | | RETURN SLUDGE PUMP HOUSE | | | |
| TAG No. | S11 MV01 to 05 | EQUIPMENT NAME | CONNECTION VALVES A | CAPACITY | 5.5kW |

DRIVE SYSTEM



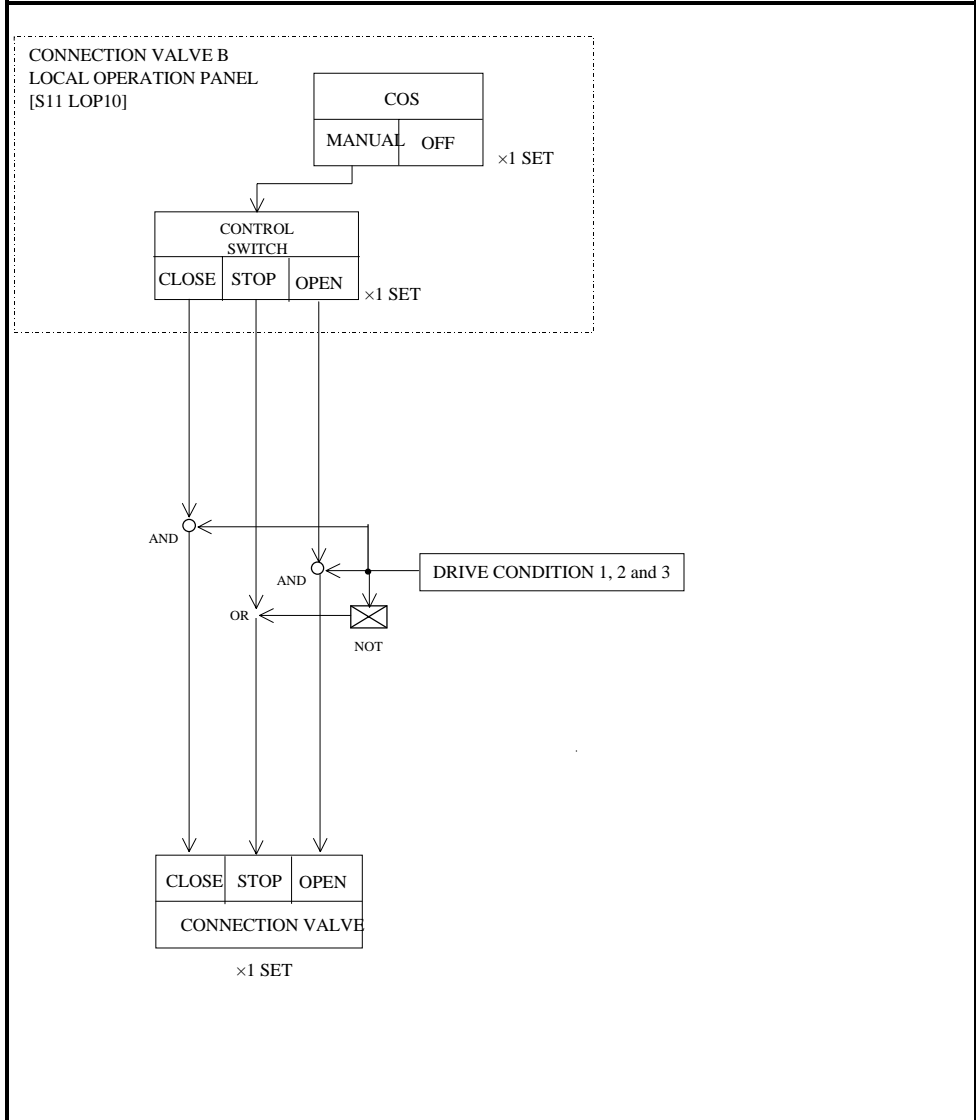
- DRIVE CONDITION**
1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
 2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
 3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--------------------------------------|----------------|--------------|-----------------|---|-----------|-------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | | ○ | | | | | |
| OFF | | ○ | | | | | |
| CLOSE | | ○ x 2 | | ○ x 2 | | | |
| STOP | | ○ x 2 | | ○ x 2 | | | |
| OPEN | | ○ x 2 | | ○ x 2 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MANUAL - OFF | COS | ○ | | | | | |
| CLOSE - STOP - OPE | CS | ○ x 2 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ x 2 | | ○ x 2 | |
| OVER LOAD | T | ○ x 2 | | | | | |
| OVER CURRENT GROUNDING | T | ○ x 2 | | | | | |
| OVER TORQUE | T | ○ x 2 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

C2-50

| | | | | | |
|---------------|----------------|--------------------------|--------------------|----------|-------|
| FACILITY NAME | | RETURN SLUDGE PUMP HOUSE | | | |
| TAG No. | S11 MV01 to 05 | EQUIPMENT NAME | CONNECTION VALVE B | CAPACITY | 7.5kW |

DRIVE SYSTEM



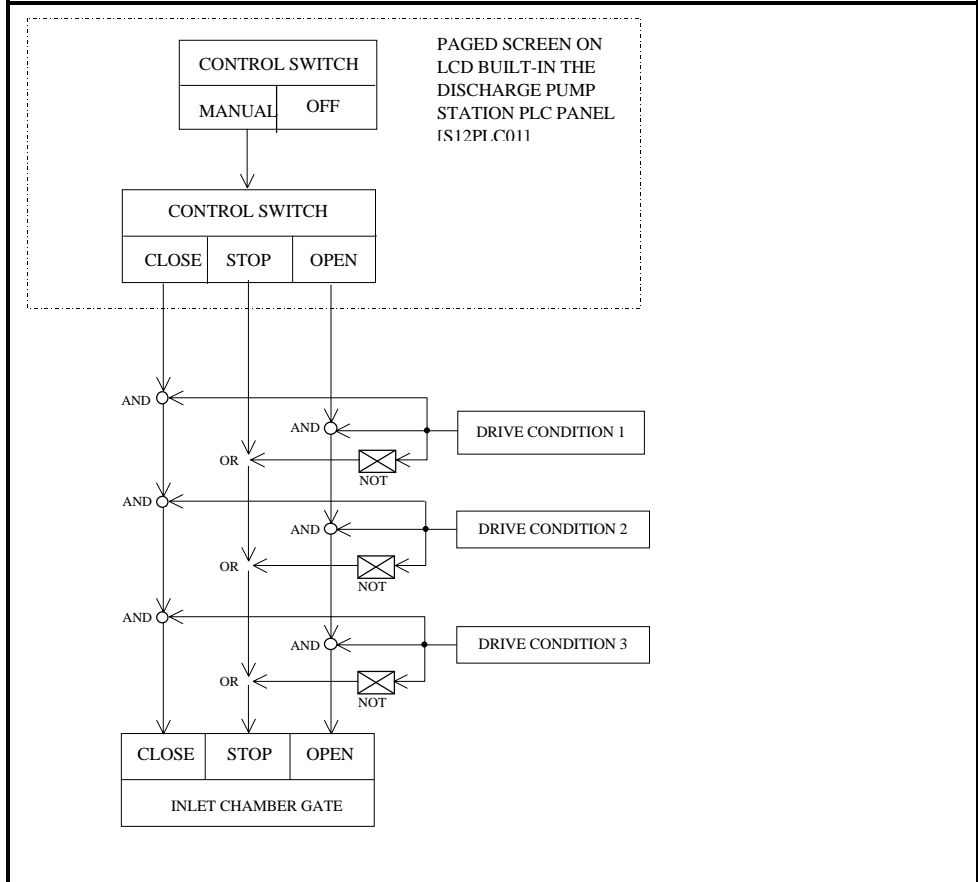
DRIVE CONDITION

1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|--------------------------|-----------------------|-----------------------|---|-----------|-----------------------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | MANUAL | <input type="radio"/> | | | | | |
| | OFF | <input type="radio"/> | | | | | |
| | CLOSE | <input type="radio"/> | | <input type="radio"/> | | | |
| | STOP | <input type="radio"/> | | <input type="radio"/> | | | |
| DRIVE OPERATION | OPEN | <input type="radio"/> | | <input type="radio"/> | | | |
| | MANUAL - OFF COS | <input type="radio"/> | | | | | |
| FAULT / ABNORMAL INDICATIONS | CLOSE - STOP - OPE CS | <input type="radio"/> | | | | | |
| | FAULT | | | <input type="radio"/> | | <input type="radio"/> | |
| | OVER LOAD | T | <input type="radio"/> | | | | |
| | OVER CURRENT GROUNDING | T | <input type="radio"/> | | | | |
| | OVER TORQUE | T | <input type="radio"/> | | | | |

| | | | | | |
|---------------|---------|------------------------|--------------------|----------|--------|
| FACILITY NAME | | DISCHARGE PUMP STATION | | | |
| TAG No. | S12MG01 | EQUIPMENT NAME | INLET CHAMBER GATE | CAPACITY | 3.7 kW |

DRIVE SYSTEM



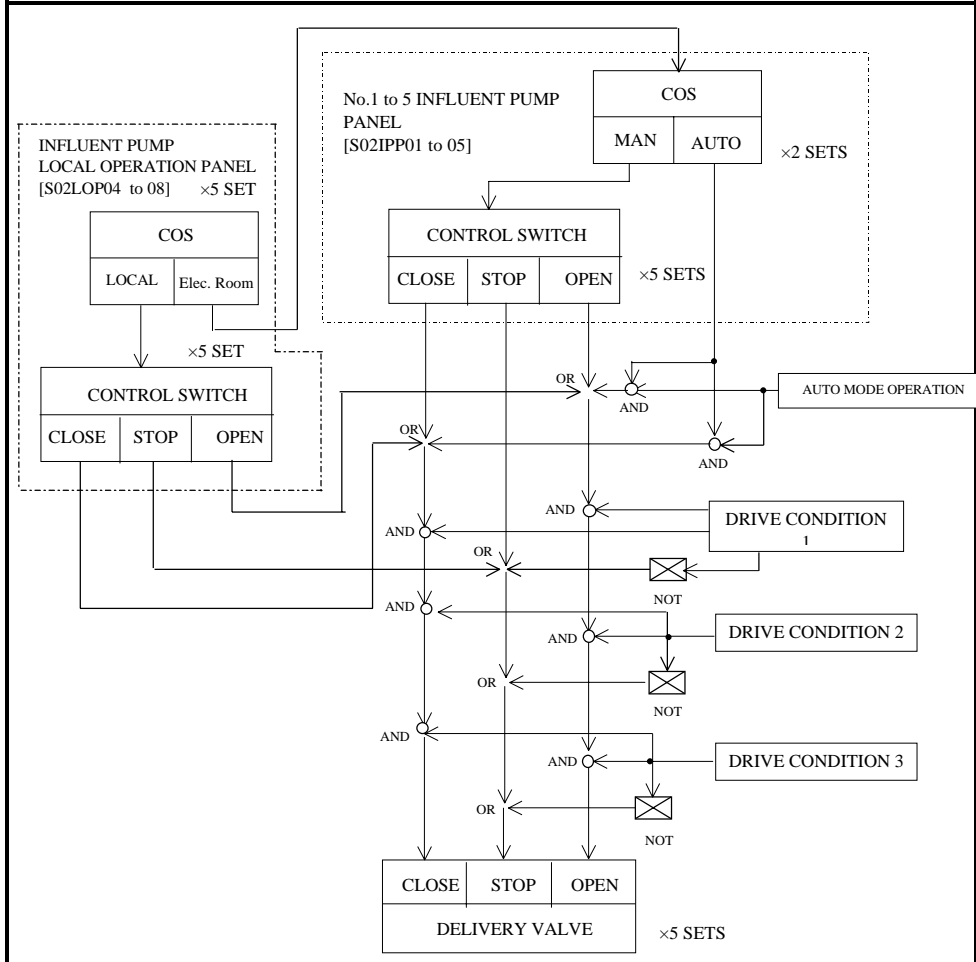
- DRIVE CONDITION**
1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
 2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
 3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|---------------------|--------------|-----------------------------|---|-----------|----|------|
| | | LP | PLC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | OPEN | | ○ | ○ | | | |
| | STOP | | ○ | ○ | | | |
| | CLOSE | | ○ | ○ | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| DRIVE OPERATION | MAN - OFF | COS | ○ | | | | |
| | OPEN - STOP - CLOSE | CS | ○ | | | | |
| | | | | | | | |
| FAULT / ABNORMAL INDICATIONS | FAULT | | | ○ | | ○ | |
| | OVER LOAD | T | | ○ | | | |
| | OVER TORQUE | T | | ○ | | | |
| | | | | | | | |
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| | | | | | | | |

C2-52

| | | | | | |
|---------------|---------------|------------------------|-----------------|----------|------------|
| FACILITY NAME | | DISCHARGE PUMP STATION | | | |
| TAG No. | S12MV01 to 05 | EQUIPMENT NAME | DELIVERY VALVES | CAPACITY | 0.75/0.4kW |

DRIVE SYSTEM



AUTO MODE OPERATION

1. To open or close following the start or the stop of the relevant influent pump respectively with some time lag.

DRIVE CONDITION

1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|---------------------|----------------|--------------|-----------------------------|---|-----------|-----|------|
| | | LP | INFLUENT PUMP PANELS | CRT | OPERATION | PR | |
| AUTO | | | | | | | |
| MANUAL | | | | | | | |
| LOCAL | | | | | | | |
| REMOTE | | | | | | | |
| CLOSE | | ○×5 | ○×5 | ○×5 | | | |
| STOP | | ○×5 | ○×5 | ○×5 | | | |
| OPEN | | ○×5 | ○×5 | ○×5 | | | |
| MAN - AUTO | COS | | | | | | |
| LOCAL - REMOTE | COS | | | | | | |
| CLOSE - STOP - OPEN | CS | ○×5 | ○×5 | | | | |
| FAULT | | | | | ○×5 | ○×5 | |
| OVER LOAD | T | ○×5 | ○×5 | | | | |
| OVER TORQUE | T | ○×5 | ○×5 | | | | |
| OVER CURRENT GROUND | T | ○×5 | ○×5 | | | | |

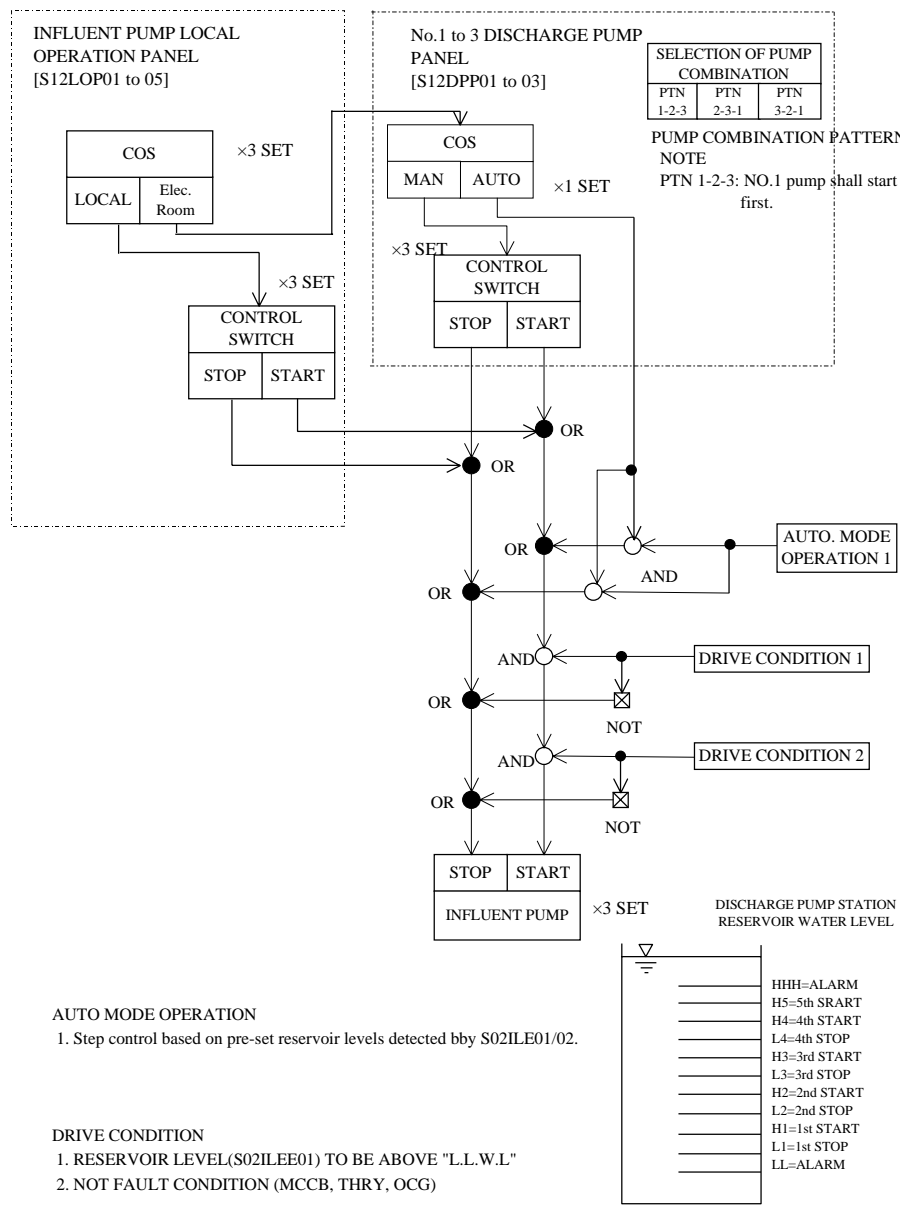
DRIVE / CONDITION INDICATIONS

DRIVE OPERATION

FAULT / ABNORMAL INDICATIONS

| | | | | | |
|---------------|---------------|------------------------|-----------------|----------|--------|
| FACILITY NAME | | DISCHARGE PUMP STATION | | | |
| TAG No. | S12CP01 to 03 | EQUIPMENT NAME | DISCHARGE PUMPS | CAPACITY | 200 kW |

DRIVE SYSTEM

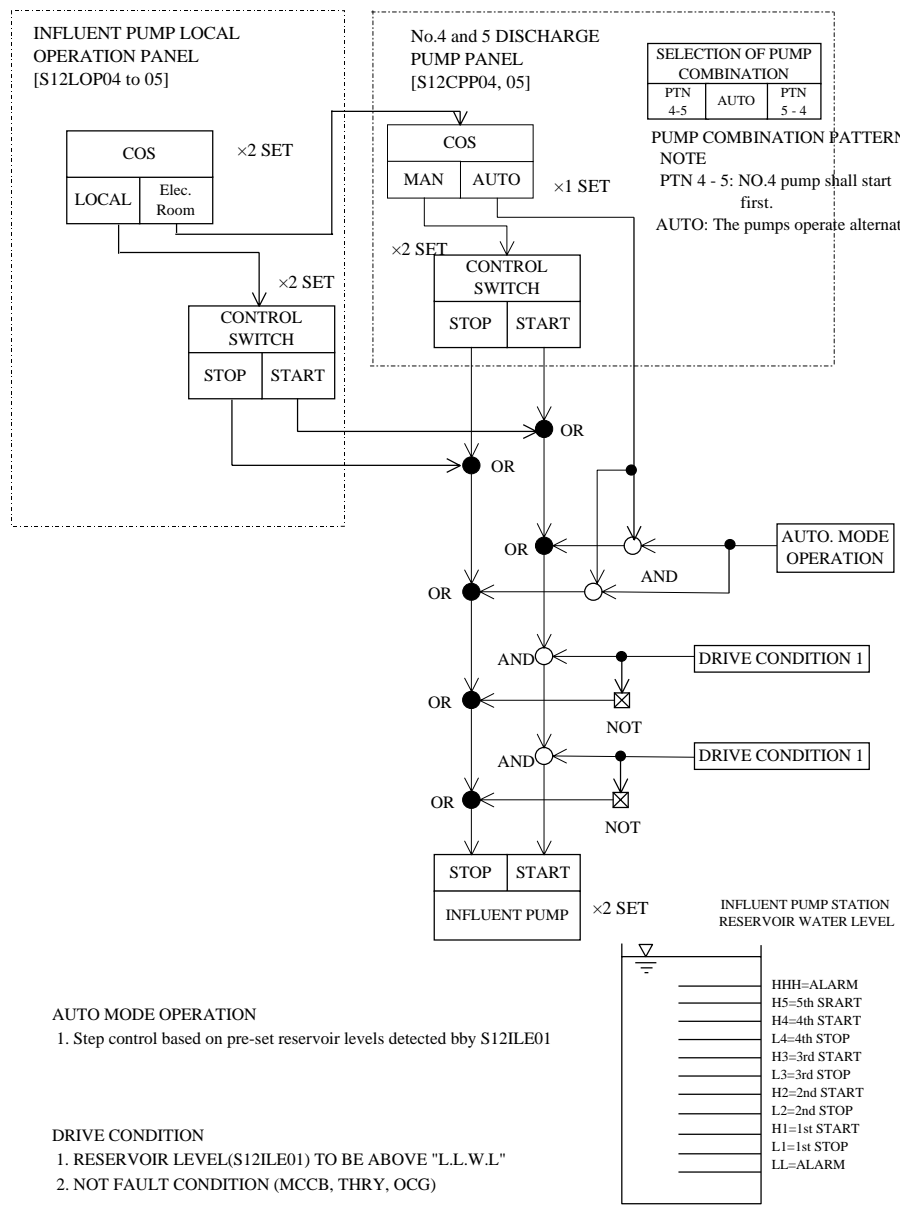


| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|---|----------------|--------------|-----------------------------|---|-----------|-----|------|
| | | LP | INFLUENTR PUMP PANEL | CRT | OPERATION | PR | |
| MANUAL | | | ○×3 | | | | |
| AUTO | | | ○×3 | | | | |
| LOCAL | | ○×3 | | | | | |
| REMOTE | | ○×3 | | | | | |
| START | | ○×3 | ○×3 | ○×3 | | | |
| STOP | | ○×3 | ○×3 | ○×3 | | | |
| MAN - OFF - AUTO | COS | | ○ | | | | |
| LOCAL - Electrical Room | COS | ○×3 | | | | | |
| START - STOP | CS | ○×3 | ○×3 | | | | |
| FAULT | | | | ○×3 | | ○×3 | |
| OVER LOAD | T | ○×3 | ○×3 | | | | |
| OVER CURENT GROUNDIN | T | ○×3 | ○×3 | | | | |
| SEWAGE LIFT PUMP WET WELL LEVEL "H.H.W.L" | | ○ | ○ | ○ | | ○ | |
| SEWAGE LIFT PUMP WET WELL LEVEL "L.L.W.L" | T | ○ | ○ | ○ | | ○ | |
| SHAFT BEARING OVERHEA | T | ○×3 | ○×3 | | | | |
| NO SEAL WATER | T | ○×3 | ○×3 | | | | |
| JAM | T | ○×3 | ○×3 | | | | |

C2-54

| | | | | | |
|---------------|---------------|------------------------|-----------------|----------|--------|
| FACILITY NAME | | DISCHARGE PUMP STATION | | | |
| TAG No. | S12CP04 to 05 | EQUIPMENT NAME | DISCHARGE PUMPS | CAPACITY | 110 Kw |

DRIVE SYSTEM



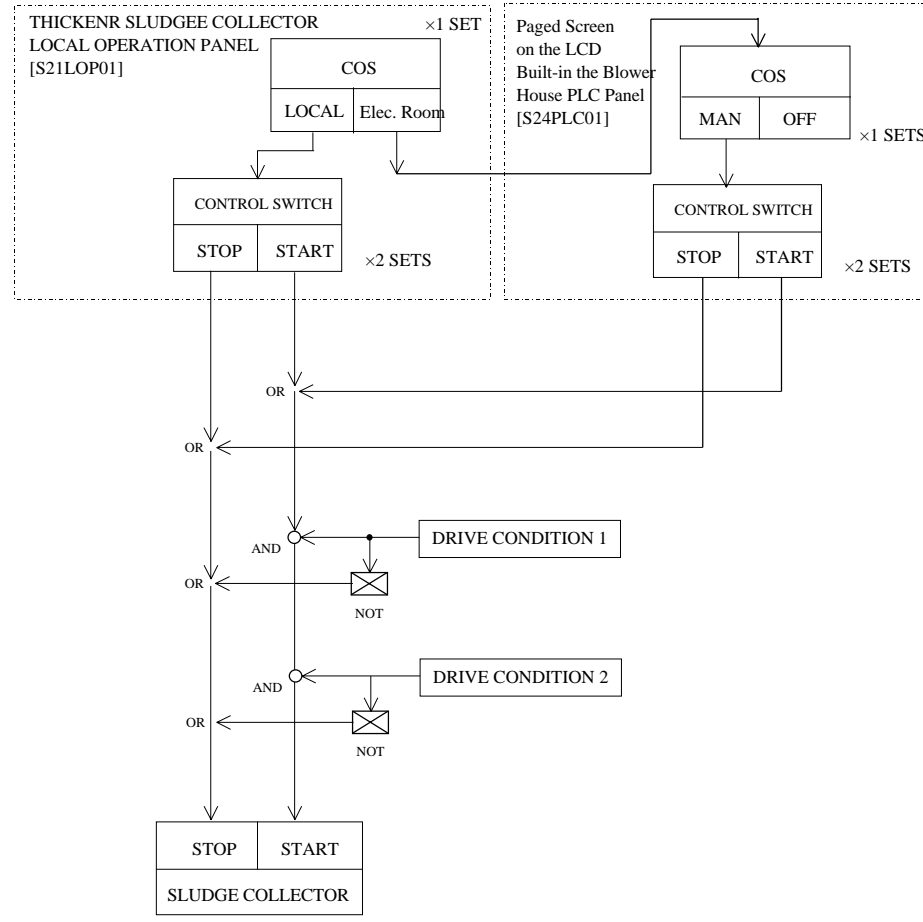
AUTO MODE OPERATION
 1. Step control based on pre-set reservoir levels detected by S12ILE01

DRIVE CONDITION
 1. RESERVOIR LEVEL(S12ILE01) TO BE ABOVE "L.L.W.L"
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | LOW VOLTAGE ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------|----------------|--------------|-----------------------------|---|-----------|-----|------|
| | | LP | INFLUENTR PUMP PANEL | CRT | OPERATION | PR | |
| MANUAL | | | ○×2 | | | | |
| AUTO | | | ○×2 | | | | |
| LOCAL | | ○×2 | ○×2 | | | | |
| Electrical Room | | ○×2 | ○×2 | | | | |
| START | | ○×2 | ○×2 | ○×2 | | | |
| STOP | | ○×2 | ○×2 | ○×2 | | | |
| MAN - OFF - AUTO | | | ○ | | | | |
| LOCAL - Electrical Room | | ○×2 | | | | | |
| START - STOP | | ○×2 | ○×2 | | | | |
| FAULT | | | | ○×2 | | ○×2 | |
| OVER LOAD | T | ○×2 | ○×2 | | | | |
| OVER CURENT GROUNDIN | T | ○×2 | ○×2 | | | | |
| SHAFT BEARING OVERHEA | T | ○×3 | ○×3 | | | | |
| NO SEAL WATER | T | ○×3 | ○×3 | | | | |
| JAM | T | ○×3 | ○×3 | | | | |

| | | | | | |
|---------------|-------------|-------------------|-----------------------------|----------|---------|
| FACILITY NAME | | GRAVITY THICKENER | | | |
| TAG No. | S21GSC01/02 | EQUIPMENT NAME | THICKENER SLUDGE COLLECTORS | CAPACITY | 0.75 kW |

DRIVE SYSTEM

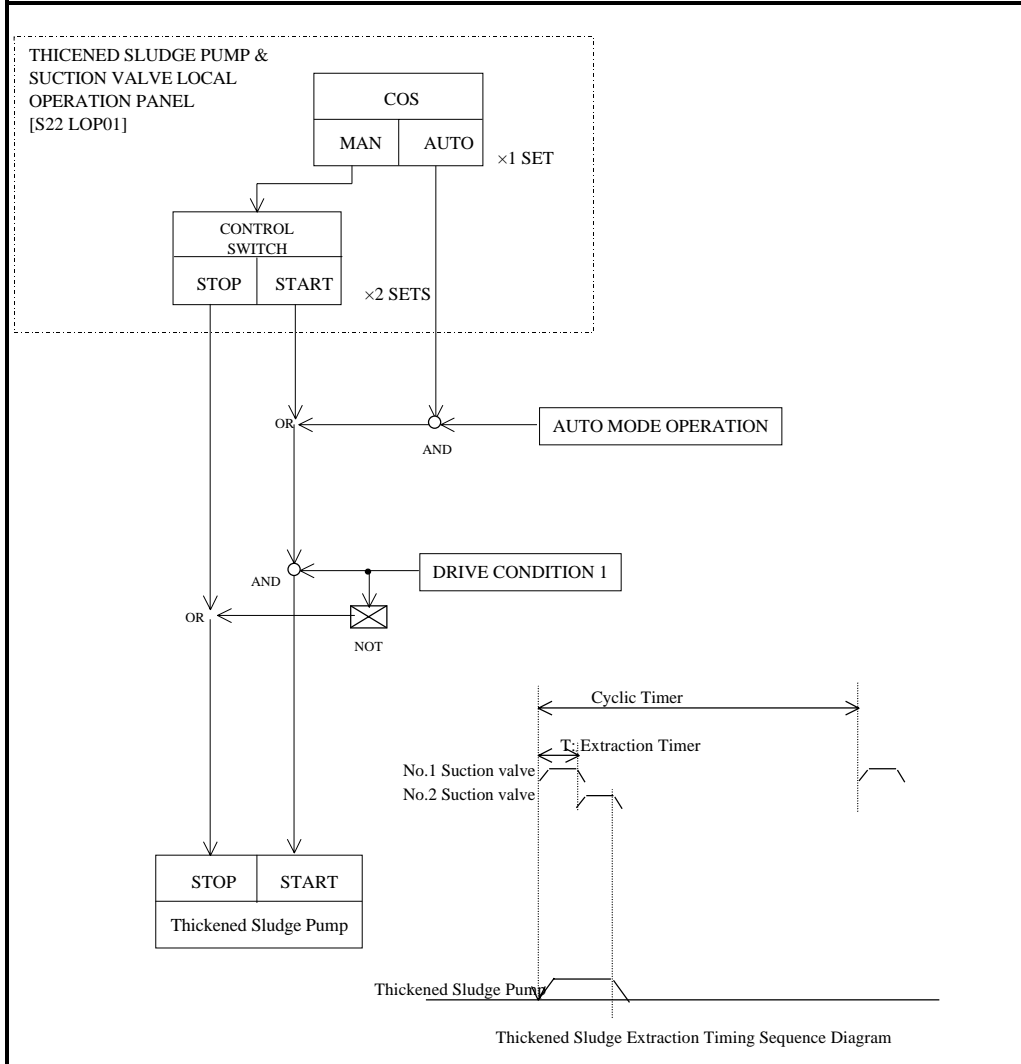


DRIVE CONDITION
 2. TS (Torque limit switch) NOT TO BE ACTUATED
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | Sludge Treatment Building 1F LV ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--------------------------------------|----------------|--------------|---|---|-----------|-------|------|
| | | LP | PLC | CRT | OPERATION | PR | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| LOCAL | | ○ | | | | | |
| Electrical Room | | ○ | | | | | |
| MANUAL | | | ○ | | | | |
| OFF | | | ○ | | | | |
| STOP | | ○ x 2 | ○ x 2 | ○ x 2 | | | |
| START | | ○ x 2 | ○ x 2 | ○ x 2 | | | |
| DRIVE OPERATION | | | | | | | |
| LOCAL - Elec. Room | COS | ○ x 2 | | | | | |
| MAN - OFF | COS | | ○ x 2 | | | | |
| START - STOP | CS | ○ x 2 | ○ x 2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |
| FAULT | | | | ○ x 2 | | ○ x 2 | |
| OVER LOAD | T | ○ x 2 | | | | | |
| OVER CURRENT GROUND | T | ○ x 2 | | | | | |
| OVER TORQUE | T | ○ x 2 | | | | | |

| | | | | | |
|---------------|------------|-------------------|------------------------|----------|-------|
| FACILITY NAME | | GRAVITY THICKENER | | | |
| TAG No. | S21SP01/02 | EQUIPMENT NAME | THICKENED SLUDGE PUMPS | CAPACITY | 3.7kW |

DRIVE SYSTEM



Thickened Sludge Extraction Timing Sequence Diagram

Note: The cyclic timer and the extraction timer shall be adjustable on the paged screen of LCD built-in the blower house PLC panel.

AUTO MODE OPERATION

- To operate based on pre-set timing sequence as shown above together with the suction sludge valves.

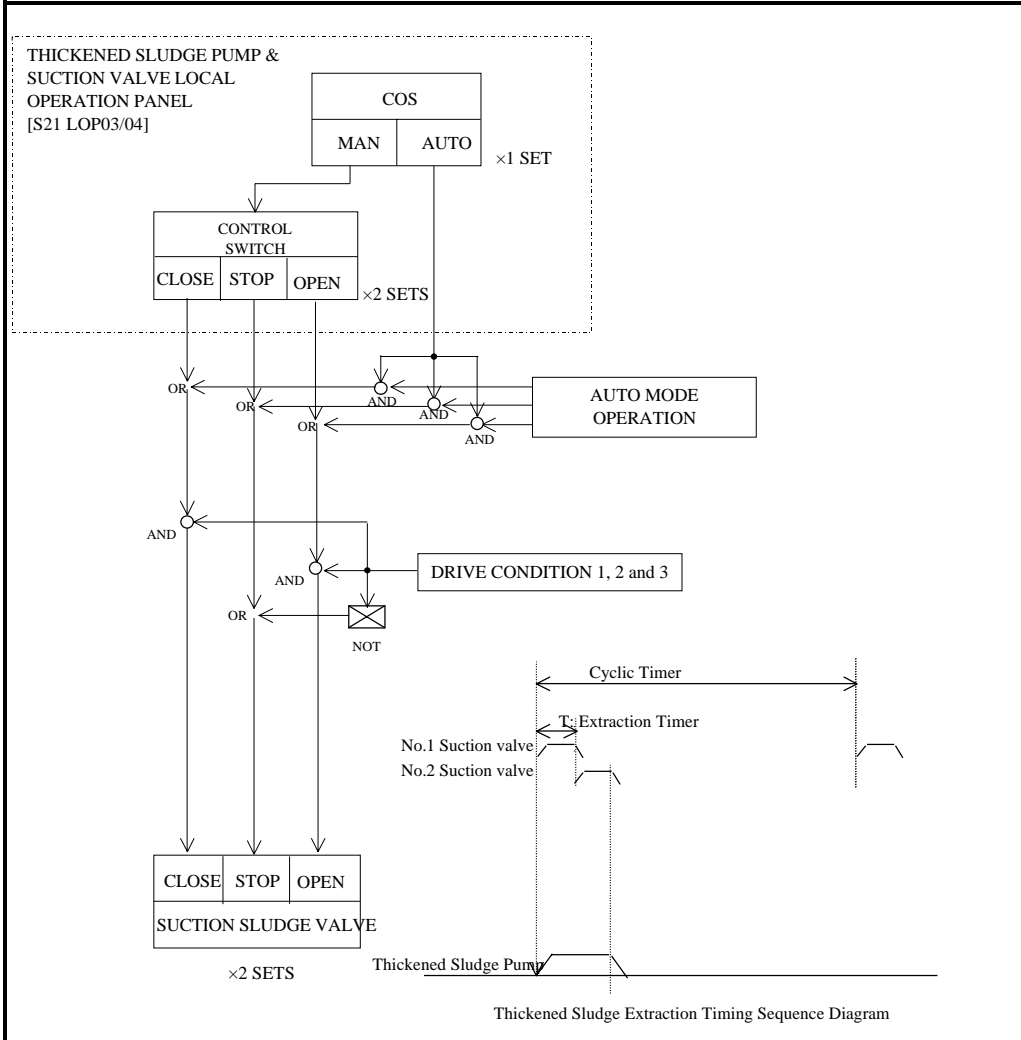
DRIVE CONDITION

- NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | Sludge Treatment Building ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--------------------------------------|----------------|--------------|---|---|-----------|-------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | | ○ | | | | | |
| AUTO | | ○ | | | | | |
| No.1 | | ○ | | | | | |
| AUTO | | ○ | | | | | |
| No.2 | | ○ | | | | | |
| STOP | | ○ x 2 | | ○ x 2 | | | |
| START | | ○ x 2 | | ○ x 2 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | ○ | | | | | |
| No.1 - AUTO - No.2 | COS | ○ | | | | | |
| START - STOP | CS | ○ x 2 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ x 2 | | ○ x 2 | |
| OVER LOAD | T | ○ x 2 | | | | | |
| OVER CURRENT GROUNDING | T | ○ x 2 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|----------------|-------------------|-----------------------|----------|-------|
| FACILITY NAME | | GRAVITY THICKENER | | | |
| TAG No. | S21 MV01 to 02 | EQUIPMENT NAME | SUCTION SLUDGE VALVES | CAPACITY | 0.2kW |

DRIVE SYSTEM



Note: The cyclic timer and the extraction timer shall be adjustable on the paged screen of LCD built-in the blower house PLC panel.
AUTO MODE OPERATION

1. To operate based on pre-set timing sequence as shown above together with the thickened sludge pumps.

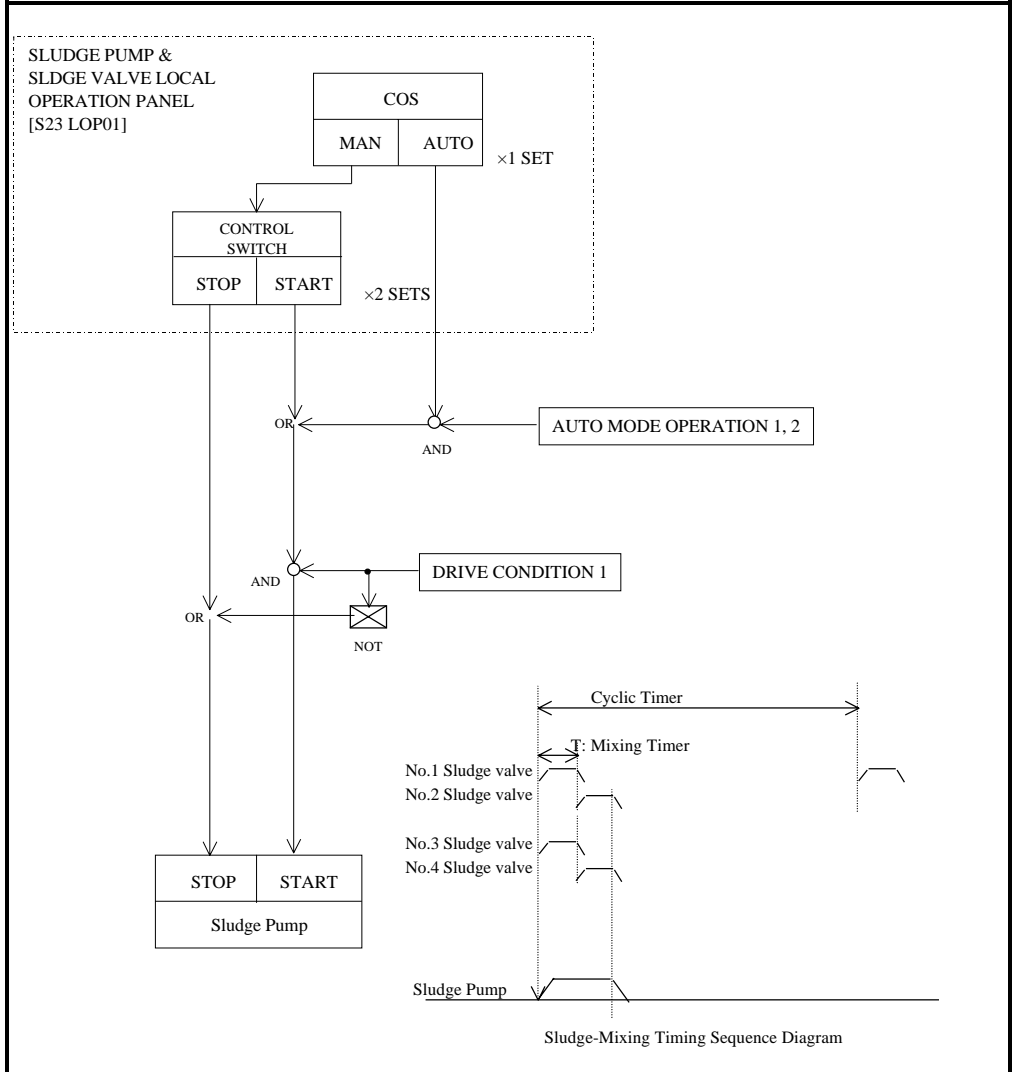
DRIVE CONDITION

1. Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
2. Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
3. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | Sludge Treatment Building ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--------------------------------------|----------------|---------------------------|---|---|-----------|-------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | } | COMMON SWITCH TO PUMPS | | | | | |
| AUTO | | AND SUCTION SLUDGE VALVES | | | | | |
| STOP | | ○ x 2 | | ○ x 2 | | | |
| START | | ○ x 2 | | ○ x 2 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| CLOSE - STOP - OPE CS | | ○ x 2 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ x 2 | | ○ x 2 | |
| OVER LOAD | T | ○ x 2 | | | | | |
| OVER CURRENT GROUNDING | T | ○ x 2 | | | | | |
| OVER TORQUE | T | ○ x 2 | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|------------|-------------------|--------------|----------|------|
| FACILITY NAME | | GRAVITY THICKENER | | | |
| TAG No. | S23SP01/02 | EQUIPMENT NAME | SLUDGE PUMPS | CAPACITY | 22kW |

DRIVE SYSTEM



Note: The cyclic timer and the mixing timer shall be adjustable on the paged screen of LCD built-in the blower house PLC panel.

AUTO MODE OPERATION

- To operate based on pre-set timing sequence as shown above together with the sludge valves
- To operate based on the digested sludge holding tank level detected by ILE2407/08.

DRIVE CONDITION

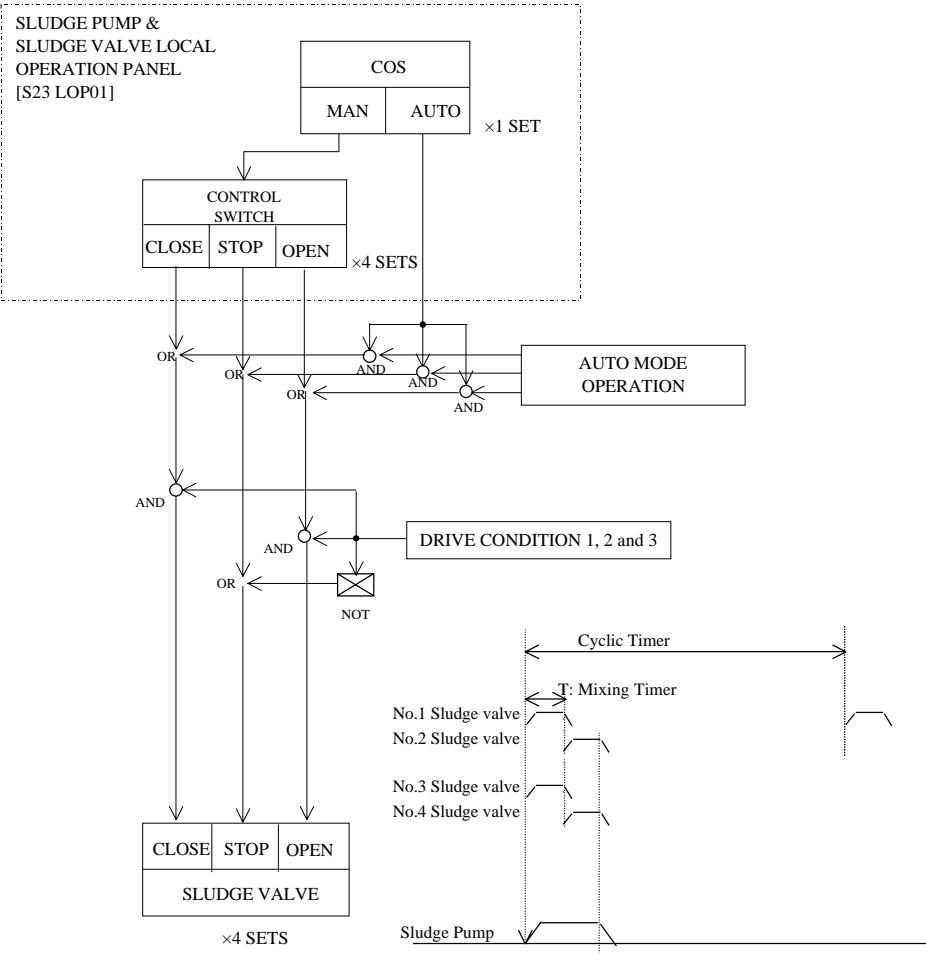
- NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | Sludge Treatment Building ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|------------------------|----------------|--------------|---|---|-----------|-------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | | ○ | | | | | |
| AUTO | | ○ | | | | | |
| No.1 | | ○ | | | | | |
| AUTO | | ○ | | | | | |
| No.2 | | ○ | | | | | |
| STOP | | ○ x 2 | | | ○ x 2 | | |
| START | | ○ x 2 | | | ○ x 2 | | |
| MAN - AUTO | COS | ○ | | | | | |
| No.1 - AUTO - No.2 | COS | ○ | | | | | |
| START - STOP | CS | ○ x 2 | | | | | |
| FAULT | | | | | ○ x 2 | ○ x 2 | |
| OVER LOAD | T | | ○ x 2 | | | | |
| OVER CURRENT GROUNDING | T | | ○ x 2 | | | | |

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| | | | | | |
|---------------|----------------|----------------|---------------|----------|-------|
| FACILITY NAME | | DIGESTER | | | |
| TAG No. | S23 MV01 to 04 | EQUIPMENT NAME | SLUDGE VALVES | CAPACITY | 0.4kW |

DRIVE SYSTEM



Note: The cyclic timer and the mixing timer shall be adjustable on the paged screen of LCD built-in the blower house PLC panel.
AUTO MODE OPERATION

- To operate based on pre-set timing sequence as shown above together with the sludge pumps.

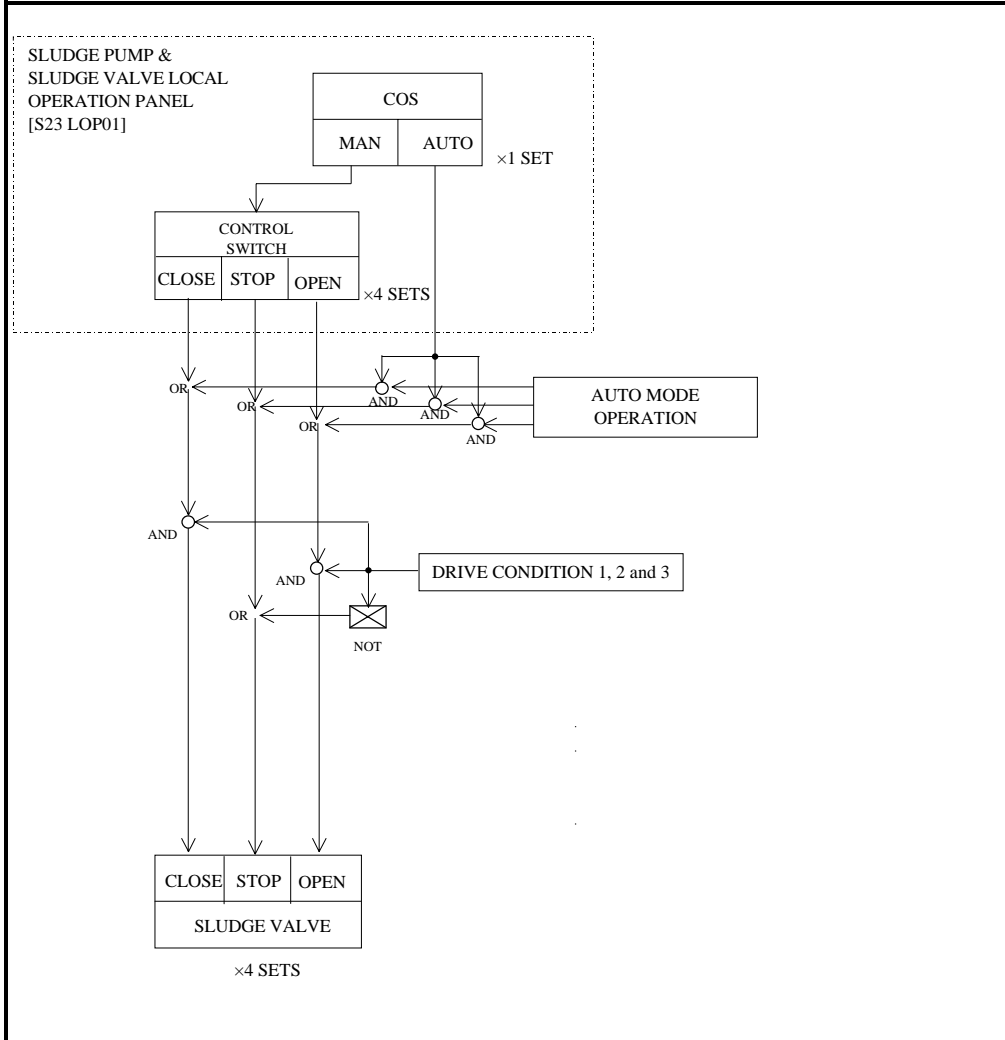
DRIVE CONDITION

- Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
- Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
- NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | Sludge Treatment Building ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|------------------------|----------------|--|---|---|-----------|-------|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | } | COMMON SWITCH TO PUMPS AND SLUDGE VALVES | | | | | |
| AUTO | | | | | | | |
| STOP | | ○ x 2 | | ○ x 2 | | | |
| START | | ○ x 2 | | ○ x 2 | | | |
| CLOSE - STOP - OPE CS | | ○ x 4 | | | | | |
| FAULT | | | | ○ x 4 | | ○ x 4 | |
| OVER LOAD | T | ○ x 4 | | | | | |
| OVER CURRENT GROUNDING | T | ○ x 4 | | | | | |
| OVER TORQUE | T | ○ x 4 | | | | | |

| | | | | | |
|---------------|----------|----------------|--------------|----------|-------|
| FACILITY NAME | | DIGESTER | | | |
| TAG No. | S23 MV05 | EQUIPMENT NAME | SLUDGE VALVE | CAPACITY | 0.4kW |

DRIVE SYSTEM



Note: The cyclic timer and the mixing timer shall be adjustable on the paged screen of LCD built-in the blower house PLC panel.
AUTO MODE OPERATION

- To operate based on the digested sludge holding tank level detected by S24ILE07/08 together with the sludge pumps.

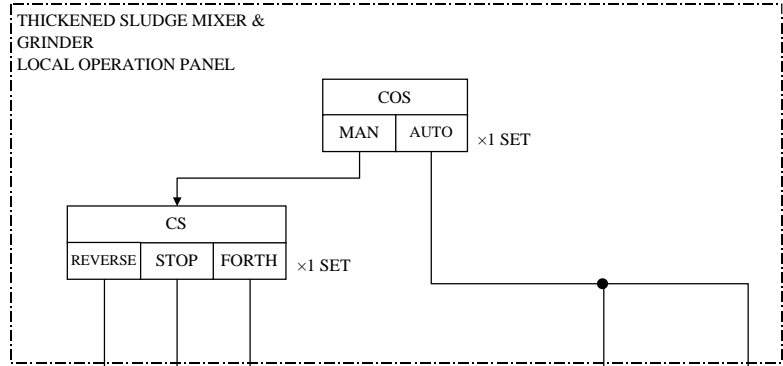
DRIVE CONDITION

- Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively
- Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively
- NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | Sludge Treatment Building ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|-------------------------------|----------------|--|---|---|-----------|----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| MANUAL | } | COMMON SWITCH TO PUMPS AND SLUDGE VALVES | | | | | |
| AUTO | | | | | | | |
| STOP | | ○ | | ○ | | | |
| START | | ○ | | ○ | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| CLOSE - STOP - OPE CS | | ○ | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ | | ○ | |
| OVER LOAD | T | ○ | | | | | |
| OVER CURRENT GROUNDING | T | ○ | | | | | |
| OVER TORQUE | T | ○ | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|---------|----------------------|----------------|----------|--------|
| FACILITY NAME | | MECHANICAL THICKENER | | | |
| TAG No. | S24SG01 | EQUIPMENT NAME | SLUDGE GRINDER | CAPACITY | 3.7 kW |

DRIVE SYSTEM



LINK CONDITION

1. TO START IN ACCORDANCE WITH THICKENED SLUDGE PUMPS (S21SP01/02).
2. TO STOP BY PRE-SET DELAY TIMING SEQUENCE AFTER THE THICKENED SLUDGE PUMPS (S21SP01/02) STOP.

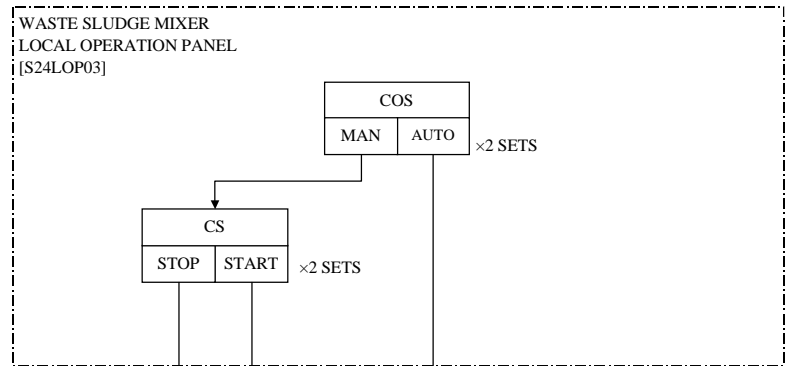
DRIVE CONDITION

1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|-----------------------|---|---|-----------|-----------------------|
| | | LP | MCC | CRT | OPERATION | |
| AUTO | | <input type="radio"/> | | | | |
| MANUAL | | <input type="radio"/> | | | | |
| FORTH | | <input type="radio"/> | | <input type="radio"/> | | |
| STOP | | <input type="radio"/> | | <input type="radio"/> | | |
| REVERSE | | <input type="radio"/> | | <input type="radio"/> | | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| MAN - AUTO | | <input type="radio"/> | | | | |
| COS | | <input type="radio"/> | | | | |
| FORTH - STOP - REVERSE | | <input type="radio"/> | | | | |
| CS | | <input type="radio"/> | | | | |
| DRIVE OPERATION | | | | | | |
| FAULT | | | | <input type="radio"/> | | <input type="radio"/> |
| OVER LOAD | T | <input type="radio"/> | | | | |
| OVER CURRENT GROUND | T | <input type="radio"/> | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |

| | | | | | |
|---------------|------------|----------------------|--------------------|----------|--------|
| FACILITY NAME | | MECHANICAL THICKENER | | | |
| TAG No. | S24SM01/02 | EQUIPMENT NAME | WASTE SLUDGE MIXER | CAPACITY | 7.5 kW |

DRIVE SYSTEM



AUTO MODE OPERATION
 1. To start based on pre-set level, "M.W.L", detected by S24ILE01/02.
 2. To stop based on pre-set level, "L.W.L", detected by S24ILE01/02.

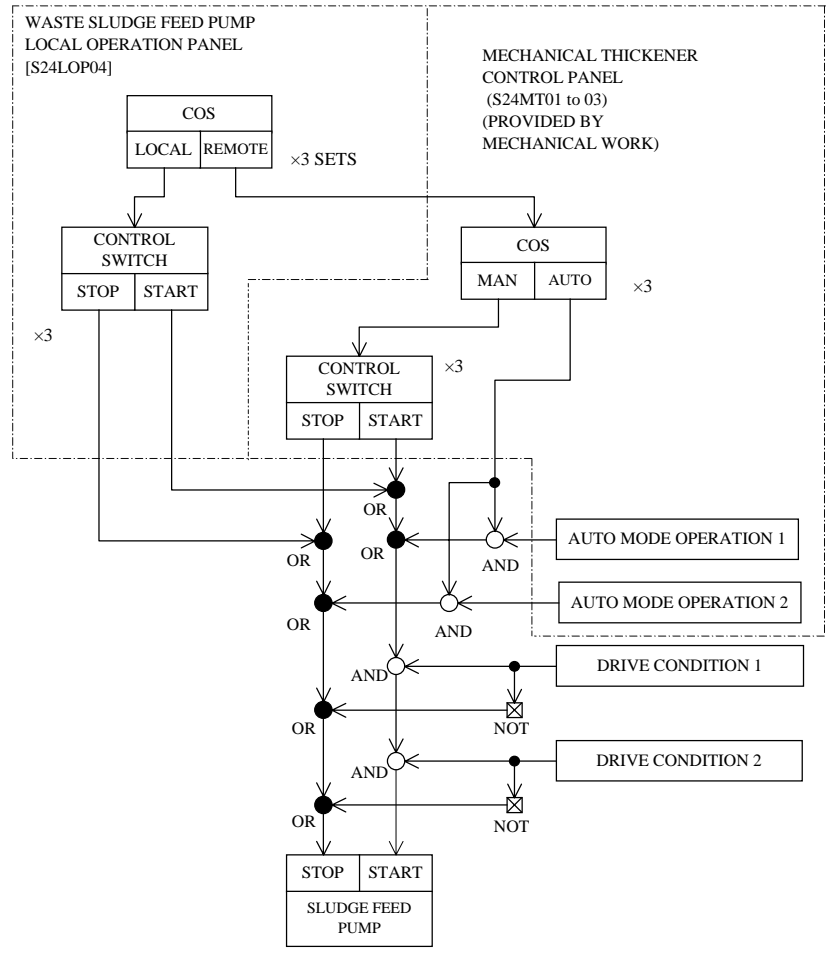
DRIVE CONDITION
 1. NOT FAULT CONDITION (MCCB, THRY, OCG)
 2. SLUDGE HOLDING TANK LEVEL (S24ILE01/02) TO BE ABOVE "L.L.W.L"

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|--------------------------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| AUTO | | ○×2 | | | | |
| MANUAL | | ○×2 | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| DRIVE OPERATION | | | | | | |
| MAN - AUTO | COS | ○×2 | | | | |
| START - STOP | CS | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| GROUNDING OVER CURRE | T | ○×2 | | | | |
| SLUDGE HOLDING TANK LEVEL "H.H.W.L" | | ○ | | ○ | | ○ |
| SLUDGE HOLDING TANK LEVEL "L.L.W.L" | T | ○ | | ○ | | ○ |

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| | | | | | |
|---------------|---------------|----------------------|------------------------|----------|-------|
| FACILITY NAME | | MECHANICAL THICKENER | | | |
| TAG No. | S24SP03 to 05 | EQUIPMENT NAME | WASTE SLUDGE FEED PUMP | CAPACITY | 30 kW |

DRIVE SYSTEM



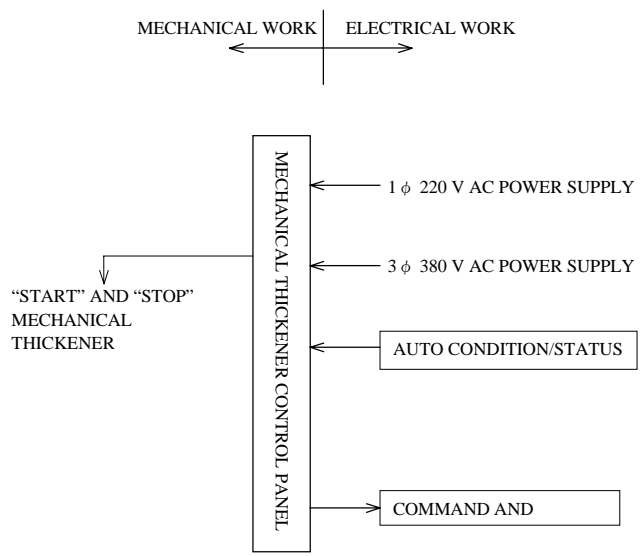
AUTOMODE OPERATION
 1. To start by the command from the relevant mechanical thickener (S24MT01/02/03).
 2. To stop by the command from the relevant mechanical thickener (S24MT01/02/03).

DRIVE CONDITION
 1. SLUDGE HOLDING TANK LEVEL (S24LE01/02) TO BE ABOVE "L.L.W.L."
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--------------------------------------|----------------|---|---|---|-----------|----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| LOCAL | | ○×3 | | | | | |
| REMOTE | | ○×3 | | | | | |
| START | | ○×3 | | ○×3 | | | |
| STOP | | ○×3 | | ○×3 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| AUTO-MAN | COS | TO BE PROVIDED ON CONTROL PANEL OF MECHANICAL THICKENER | | | | | |
| START - STOP | PBS | ○×3 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ | | ○ | |
| OVER LOAD | T | ○×3 | | | | | |
| OVER CURRENT GROUND | T | ○×3 | | | | | |
| SLUDGE HOLDING TANK LEVEL "L.L.W.L." | T | ○ | | | | | |
| SLUDGE HOLDING TANK LEVEL "H.H.W.L." | T | ○ | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| | | | | | |
|---------------|--------------|----------------------|----------------------|----------|---------------|
| FACILITY NAME | | MECHANICAL THICKENER | | | |
| TAG No. | S24MT01 to 3 | EQUIPMENT NAME | MECHANICAL THICKENER | CAPACITY | 1.5+0.75x2 kW |

DRIVE SYSTEM



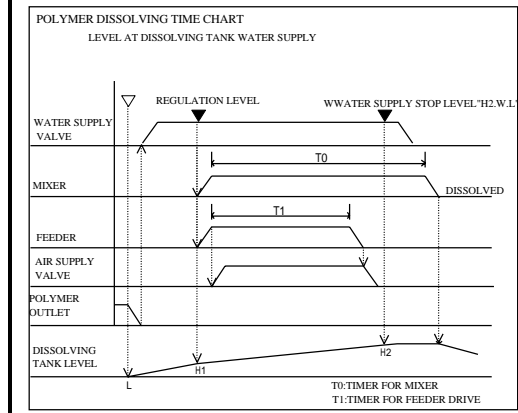
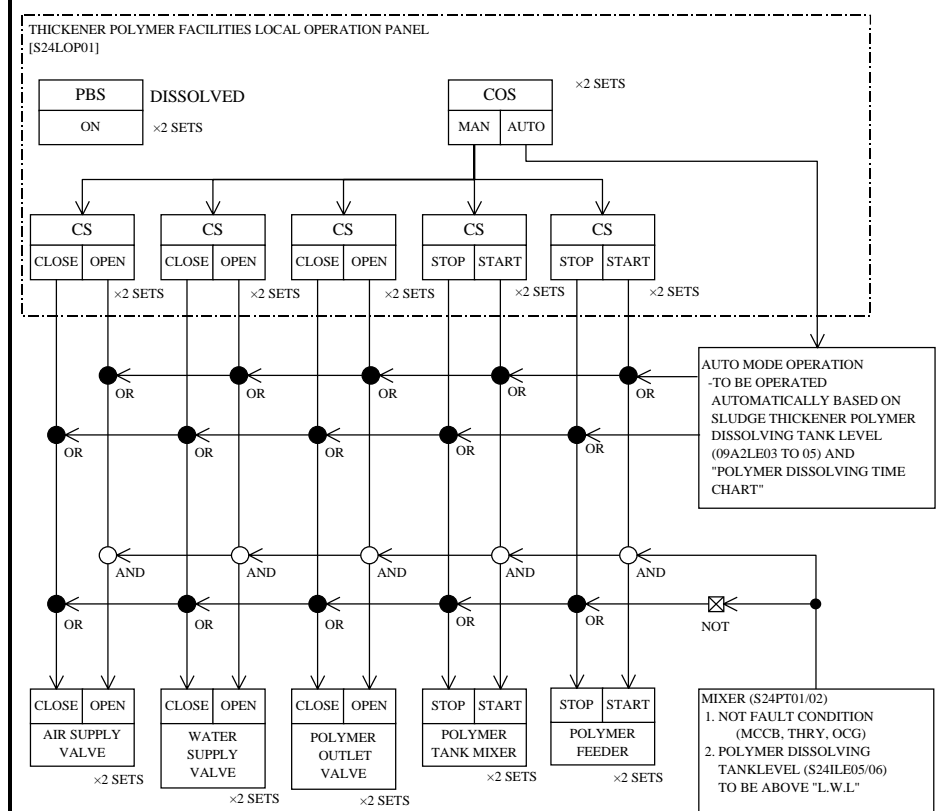
- AUTO MODE OPERATION**
1. SLUDGE HOLDING TANK LEVEL (S24ILE01/02) TO BE ABOVE "M.W.L" (STARTING SIGNAL)
 2. SLUDGE HOLDING TANK LEVEL (S24ILE01/02) TO BE ABOVE "L.W.L" (STOPPING SIGNAL)
 3. SLUDGE HOLDING TANK LEVEL (S24ILE01/02) TO BE ABOVE "L.L.W.L" (INTER-LOCKING SIGNAL)
 4. THICKENED SLUDGE HOLDING TANK LEVEL (S24ILE03/04) TO BE BELOW "H1.W.L" (STARTING SIGNAL)
 5. THICKENED SLUDGE HOLDING TANK LEVEL (S24ILE01/02) TO BE BELOW "H2.W.L" (STOPPING SIGNAL)
 6. THICKENED SLUDGE HOLDING TANK LEVEL (S24ILE03/04) TO BE BELOW "H.H.W.L" (INTER-LOCKING SIGNAL)
 7. POLYMER TANK LEVEL (S24ILE05/06) TO BE ABOVE "L.W.L" (STOPPING SIGNAL)
 8. POLYMER TANK LEVEL (S24ILE05/06) TO BE ABOVE "L.L.W.L" (INTER-LOCKING SIGNAL)
 9. WASTE WATER TANK LEVEL (S24ILS03) TO BE BELOW "H.H.W.L" (INTER-LOCKING SIGNAL)
 10. MECHANICAL THICKENER FLOW (S24IFE02/03/04) SIGNAL (4-20 mA DC) TO BE GIVEN
 11. RELEVANT SLUDGE FEED PUMP (S24SP03/04/05) "RUN"
 12. RELEVANT POLYMER FEED PUMP (S24PP01/02/03) "RUN"

- COMMAND AND STATUS FROM MECHANICAL THICKENER**
1. COMMAND OF "RUN" TO PERIPHERAL EQUIPMENT
 2. "RUN" AND "FAULT" CONDITION SIGNAL FROM MECHANICAL THICKENER

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|---|----------------|--------------|---|---|-----------|------|
| | | MECHA. DIV | MCC | CRT | OPERATION | |
| START | | | | | ○ × 3 | |
| STOP | | | | | ○ × 3 | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| DRIVE OPERATION | | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |
| FAULT | | | | | ○ | ○ |
| OVER LOAD | T | | | | | |
| SLUDGE HOLDING TANK LEVEL "L.L.W.L" | T | | | | | |
| THICKENED SLUDGE HOLDING TANK LEVEL "H.H.W.L" | T | | | | | |
| WASTE WATER TANK LEVEL "H.H.W.L" | T | | | | | |
| POLYMER TANK LEVEL "L.L.W.L" | T | | | | | |

| | | | | | |
|---------------|--------------------------|----------------------|---|----------|------------------|
| FACILITY NAME | | MECHANICAL THICKENER | | | |
| TAG No. | S24PT01/02 S24PF01/02 | EQUIPMENT NAME | POLYMER TANK / POLYMER FEEDER FOR THICKENER | CAPACITY | 3.7 kW/ 0.4kW |

DRIVE SYSTEM

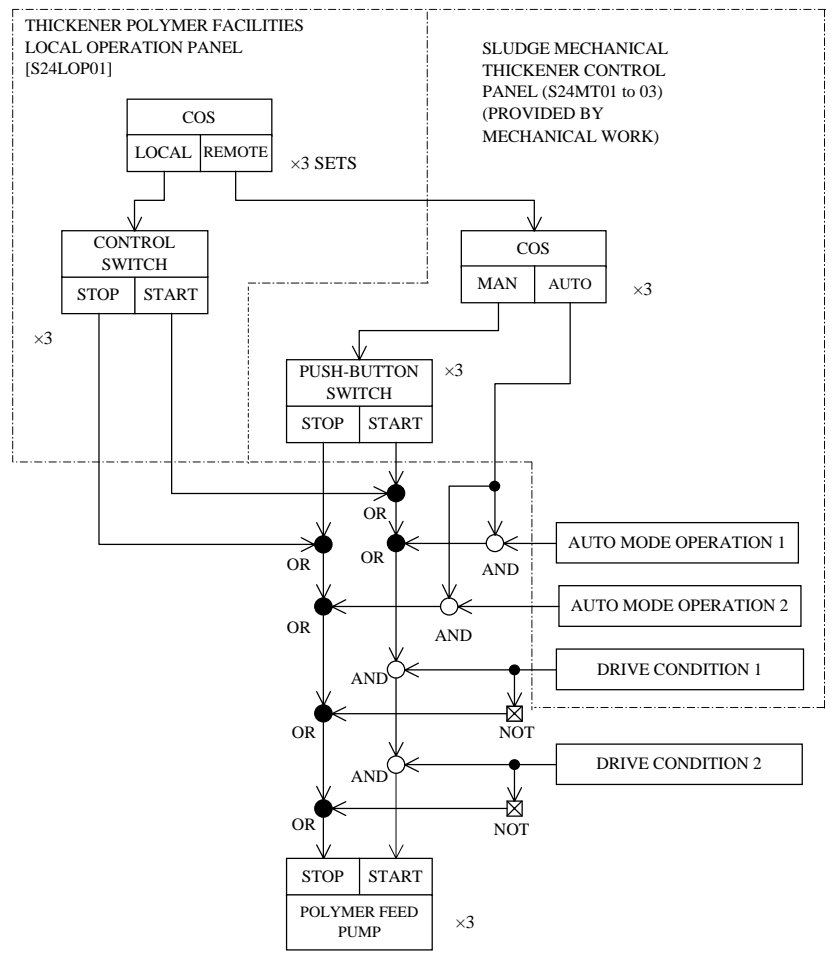


| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|---|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| MANUAL | | ○×2 | | | | |
| AUTO | | ○×2 | | | | |
| MIXER START | | ○×2 | | ○×2 | | |
| MIXER STOP | | ○×2 | | ○×2 | | |
| POLYMER FEEDER START | | ○×2 | | ○×2 | | |
| POLYMER FEEDER STOP | | ○×2 | | ○×2 | | |
| WATER SUPPLY VALVE FULL OPEN | | ○×2 | | | | |
| WATER SUPPLY VALVE FULL CLOSE | | ○×2 | | | | |
| AIR SUPPLY VALVE FULL OPEN | | ○×2 | | | | |
| AIR SUPPLY VALVE FULL CLOSE | | ○×2 | | | | |
| POLYMER OUTLET VALVE FULL OPEN | | ○×2 | | | | |
| POLYMER OUTLET VALVE FULL CLOSE | | ○×2 | | | | |
| DISSOLVED | | ○×2 | | | | |
| DISSOLVING | | ○×2 | | | | |
| FEEDING | | ○×2 | | | | |
| MAN - AUTO COS | | ○×2 | | | | |
| < POLYMER TANK MIXER > | | | | | | |
| START - STOP CS | | ○×2 | | | | |
| < POLYMER FEEDER > | | | | | | |
| START - STOP CS | | ○×2 | | | | |
| WATER SUPPLY VALVE OPEN-CLOSE CS | | ○×2 | | | | |
| AIR SUPPLY VALVE OPEN-CLOSE CS | | ○×2 | | | | |
| POLYMER OUTLET VALVE OPEN-CLOSE CS | | ○×2 | | | | |
| DISSOLVED PBS | | ○×2 | | | | |
| < POLYMER DISSOLVING TANK MIXER > | | | | | | |
| FAULT | | | | ○ | | ○ |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUNDING | T | ○×2 | | | | |
| < POLYMER FEEDER > | | | | | | |
| FAULT | | | | ○ | | ○ |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUNDING | T | ○×2 | | | | |
| POLYMER DISSOLVING TANK LEVEL "H.H.W.L" | | ○×2 | | ○×2 | | ○×2 |
| POLYMER TANK LEVEL "L.L.W.L" | T | ○×2 | | ○×2 | | ○×2 |
| POLYMER TANK "ABNORMAL" | | | | | | |
| POWDER LEVEL "L.P.L" | | ○×2 | | | | |
| DISSOLVE JAM | | ○×2 | | | | |

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| | | | | | |
|---------------|---------------|----------------------|-------------------|----------|--------|
| FACILITY NAME | | MECHANICAL THICKENER | | | |
| TAG No. | S24PP01 to 03 | EQUIPMENT NAME | POLYMER FEED PUMP | CAPACITY | 1.5 kW |

DRIVE SYSTEM



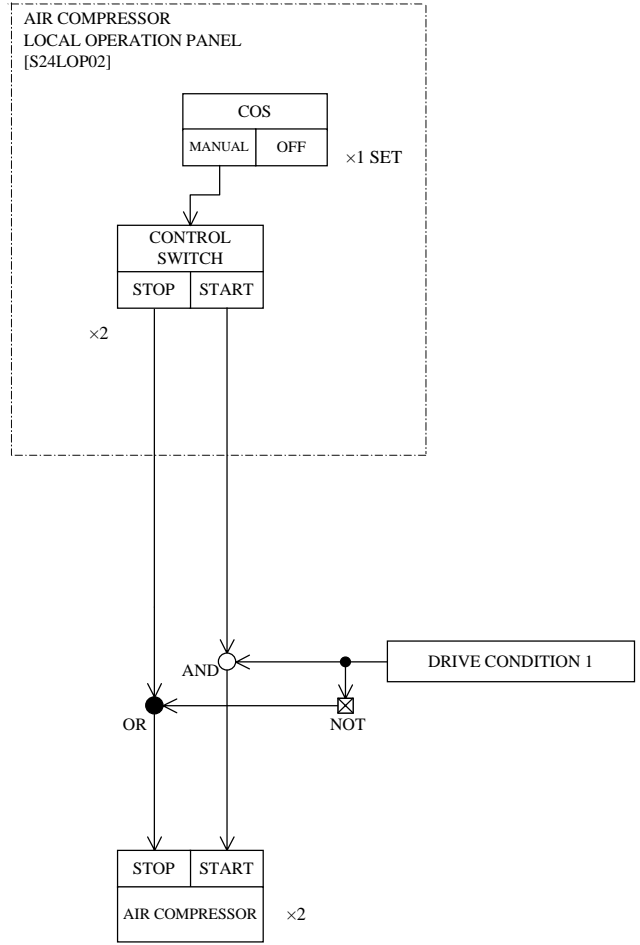
- AUTOMODE OPERATION**
- To start by the command from relevant mechanical thickener (S24MT01/02/03).
 - To stop by the command from the relevant mechanical thickener (S24MT01/02/03).
- DRIVE CONDITION**
- POLYMER TANK LEVEL (S24ILE05/06) TO BE ABOVE "L.L.W.L"
 - NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|--------------------------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| LOCAL | | ○ | | | | |
| REMOTE | | ○ | | | | |
| START | | ○×3 | | ○×3 | | |
| STOP | | ○×3 | | ○×3 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| LOCAL-REMOTE | COS | ○×3 | | | | |
| MANUAL - AUTO | COS | | ○×3 | | | |
| START - STOP | CS | ○×3 | | | | |
| DRIVE OPERATION | | | | | | |
| FAULT | | | | ○×3 | | ○×3 |
| OVER LOAD | T | ○×3 | | | | |
| OVER LOAD | T | ○×3 | | | | |
| POLYMER TANK LEVEL "L.L.W.L" | T | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |

C2-69

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|---------------|------------|----------------------|----------------|----------|--------|
| FACILITY NAME | | MECHANICAL THICKENER | | | |
| TAG No. | S24AC01/02 | EQUIPMENT NAME | AIR COMPRESSOR | CAPACITY | 1.5 kW |

DRIVE SYSTEM



DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

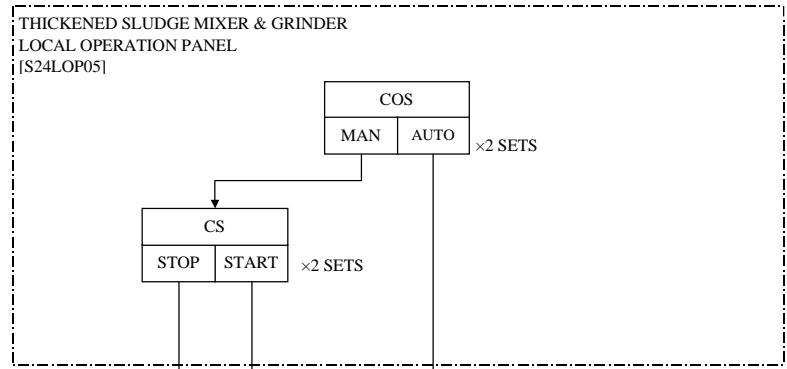
| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|--------------------------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| MANUAL | | ○ | | | | |
| OFF | | ○ | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| DRIVE OPERATION | | | | | | |
| MANUAL - OFF | COS | ○×1 | | | | |
| START - STOP | CS | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | |

C2-70

| FACILITY NAME | | MECHANICAL THICKENER | | | | ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | | NOTE |
|---|---------|----------------------|-----------|----------|--------|----------------------------------|-------------------|-----------------|--|--|-----------|----|------|
| TAG No. | S24AD01 | EQUIPMENT NAME | AIR DRYER | CAPACITY | 0.2 kW | | | MECHA.DIV | MCC | CRT | OPERATION | PR | |
| DRIVE SYSTEM | | | | | | DRIVE / CONDITION INDICATIONS | START | | | | | | |
| | | | | | | | STOP | | | | | | |
| STATUS FROM AIR DRYER | | | | | | | DRIVE OPERATION | | | | | | |
| 1. "RUN" OR "FAULT" CONDITION SIGNAL FROM AIR DRYER | | | | | | | | | | | | | |
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| | | | | | | FAULT / ABNORMAL INDICATIONS | FAULT | T | | | | | |
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|---------------|------------|----------------------|------------------------|----------|--------|
| FACILITY NAME | | MECHANICAL THICKENER | | | |
| TAG No. | S24SM03/04 | EQUIPMENT NAME | THICKENED SLUDGE MIXER | CAPACITY | 7.5 kW |

DRIVE SYSTEM



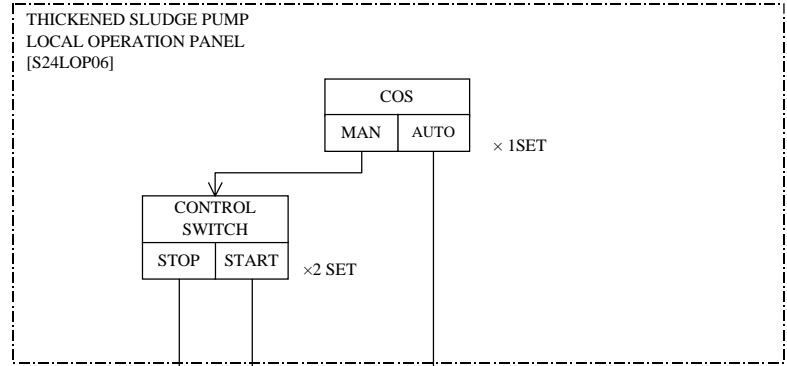
- AUTO MODE OPERATION**
- To start based on the pre-set level "M.W.L" detected by S24ILE03/04.
 - To stop based on the pre-set level "L.W.L" detected by S24ILE03/04.
- DRIVE CONDITION**
- NOT FAULT CONDITION (MCCB, THRY, OCG)
 - THICKENED SLUDGE HOLDING TANK LEVEL (S24ILE03/04) TO BE ABOVE "L.L.W.L"

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|---|----------------|--------------|---|-----|---|----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| AUTO | | ○×2 | | | | | |
| MANUAL | | ○×2 | | | | | |
| START | | ○×2 | | | ○×2 | | |
| STOP | | ○×2 | | | ○×2 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | ○×2 | | | | | |
| START - STOP | CS | ○×2 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | | |
| THICKENED SLUDGE HOLDING TANK LEVEL "H.H.W.L" | T | ○ | | | | | |
| THICKENED SLUDGE HOLDING TANK LEVEL "L.L.W.L" | T | ○ | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

02-72

| | | | | | |
|---------------|------------|----------------------|-----------------------|----------|-------|
| FACILITY NAME | | MECHANICAL THICKENER | | | |
| TAG No. | S24SP01/02 | EQUIPMENT NAME | THICKENED SLUDGE PUMP | CAPACITY | 11 kW |

DRIVE SYSTEM



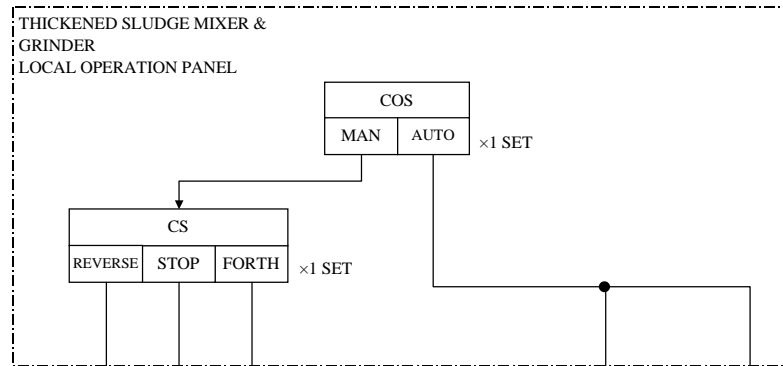
AUTO MODE OPERATION
 1. To start based on the pre-set level "M.W.L" detected by S24ILE03/04.
 1. To stop based on the pre-set level detected by S24ILE03/04.

DRIVE CONDITION
 1. THICKENED SLUDGE HOLDING TANK LEVEL (S24ILE03/04) TO BE ABOVE "L.L.W.L"
 2. DISTRIBUTION TANK LEVELS FOR DIGESTERS (S23ILE11/21) TO BE BELOW "H.H.W.L"
 3. DIGESTED TANK PRESSURE (S24IPE11/21) TO BE BELOW "H.H.P.L"
 4. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | | NOTE |
|--|----------------|--------------|---|---|-----------|-----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| AUTO | | ○ | | | | | |
| MANUAL | | ○ | | | | | |
| START | | ○x2 | | ○x2 | | | |
| STOP | | ○x2 | | ○x2 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | | ○ | | | | | |
| COS | | ○ | | | | | |
| START - STOP | | ○x2 | | | | | |
| CS | | ○x2 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○x2 | | ○x2 | |
| OVER LOAD | T | ○x2 | | | | | |
| OVER CURRENT GROUND | T | ○x2 | | | | | |
| THICKENED SULADGE HOLDING TANK LEVEL "L.L.W.L" | T | ○ | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |
| DIGESTED TANK LEVEL "H.H.W.L" | T | ○ | | ○ | | ○ | |
| DIGESTED TANK PRESSURE "H.H.P.L" | T | ○x2 | | ○x2 | | ○x2 | |

| | | | | | |
|---------------|---------|----------------------|----------------|----------|--------|
| FACILITY NAME | | MECHANICAL THICKENER | | | |
| TAG No. | S24SG01 | EQUIPMENT NAME | SLUDGE GRINDER | CAPACITY | 3.7 kW |

DRIVE SYSTEM



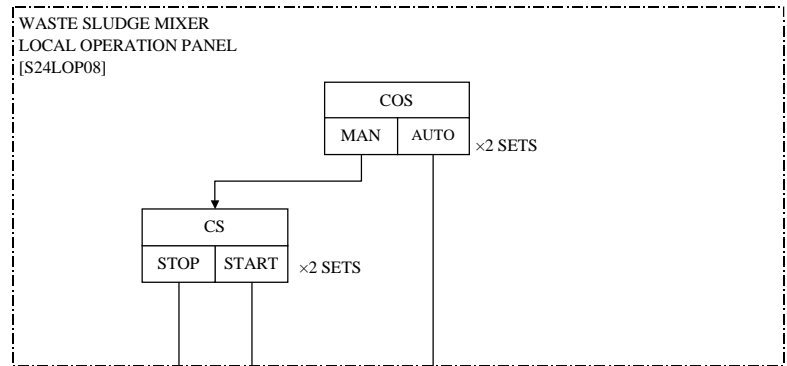
- LINK CONDITION**
1. TO START IN ACCORDANCE WITH THICKENED SLUDGE PUMPS (S21SP01/02).
 2. TO STOP BY PRE-SET DELAY TIMING SEQUENCE AFTER THE THICKENED SLUDGE PUMPS (S21SP01/02) STOP.
- DRIVE CONDITION**
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|--------------------------------------|----------------|-----------------------|-----|---|-----------|---|-----------------------|------|
| | | LP | MCC | CRT | OPERATION | PR | | |
| AUTO | | <input type="radio"/> | | | | | | |
| MANUAL | | <input type="radio"/> | | | | | | |
| FORTH | | <input type="radio"/> | | <input type="radio"/> | | | | |
| STOP | | <input type="radio"/> | | <input type="radio"/> | | | | |
| REVERSE | | <input type="radio"/> | | <input type="radio"/> | | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | | |
| MAN - AUTO | | <input type="radio"/> | | | | | | |
| COS | | <input type="radio"/> | | | | | | |
| FORTH - STOP - REVERSE | | <input type="radio"/> | | | | | | |
| CS | | <input type="radio"/> | | | | | | |
| DRIVE OPERATION | | | | | | | | |
| FAULT | | | | <input type="radio"/> | | | <input type="radio"/> | |
| OVER LOAD | T | <input type="radio"/> | | | | | | |
| OVER CURRENT GROUND | T | <input type="radio"/> | | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | | |

C2-74

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|---------------|------------|------------------|----------------------|----------|--------|
| FACILITY NAME | | DEWATERING UNITS | | | |
| TAG No. | S24SM05/06 | EQUIPMENT NAME | DGESTED SLUDGE MIXER | CAPACITY | 7.5 kW |

DRIVE SYSTEM



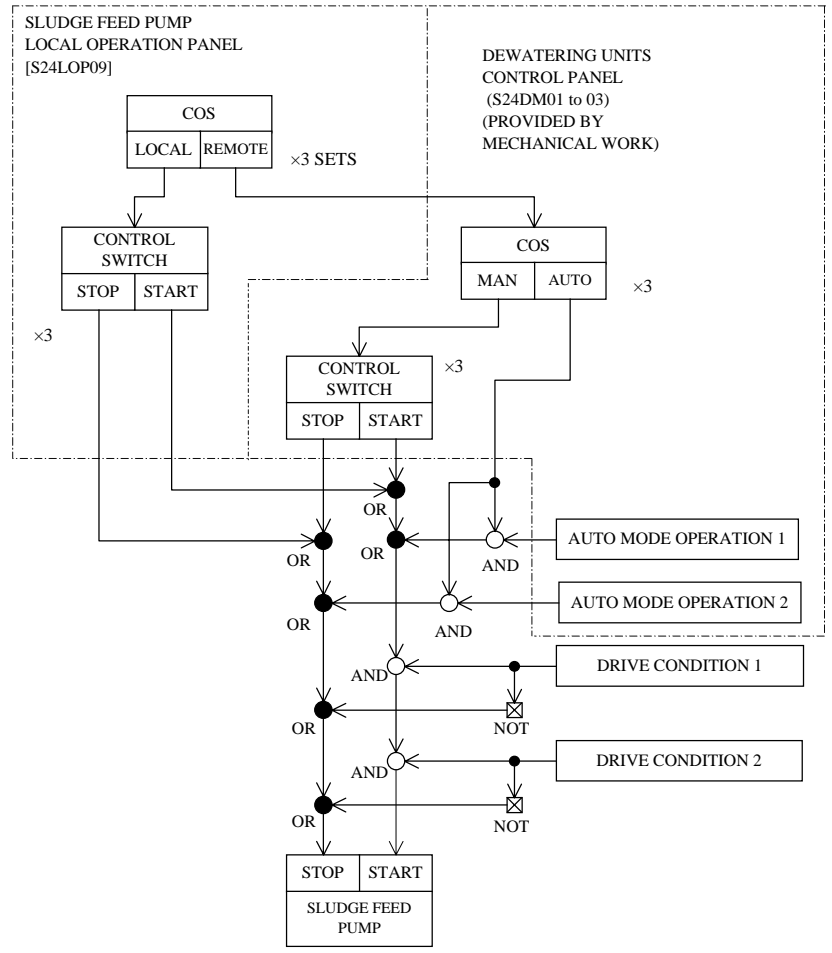
AUTO MODE OPERATION
 1. To start based on pre-set level , "M.W.L", detected by S24ILE07/08.
 2. To stop based on pre-set level, "L.W.L", detected by S24ILE07/08.

DRIVE CONDITION
 1. NOT FAULT CONDITION (MCCB, THRY, OCG)
 2. DIGESTED SLUDGE HOLDING TANK LEVEL (S24ILE07/08) TO BE ABOVE "L.L.W.L"

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|--|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| AUTO | | ○×2 | | | | |
| MANUAL | | ○×2 | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| MAN - AUTO | COS | ○×2 | | | | |
| START - STOP | CS | ○×2 | | | | |
| DRIVE OPERATION | | | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| GROUNDING OVER CURRE | T | ○×2 | | | | |
| DIGESTED SLUDGE HOLDING TANK LEVEL "H.H.W.L" | | ○ | | ○ | | ○ |
| DIGESTED SLUDGE HOLDING TANK LEVEL "L.L.W.L" | T | ○ | | ○ | | ○ |
| FAULT / ABNORMAL INDICATIONS | | | | | | |

| | | | | | |
|---------------|---------------|------------------|------------------|----------|--------|
| FACILITY NAME | | DEWATERING UNITS | | | |
| TAG No. | S24SP06 to 08 | EQUIPMENT NAME | SLUDGE FEED PUMP | CAPACITY | 7.5 kW |

DRIVE SYSTEM



AUTOMODE OPERATION
 1. To start by the command from the relevant dewatering unit (S24DM01/02/03).
 2. To stop by the command from the relevant dewatering unit (S24DM01/02/03).

DRIVE CONDITION
 1. DIGESWTED SLUDGE HOLDING TANK LEVEL (S24LE07/08) TO BE ABOVE "L.L.W.L"
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)

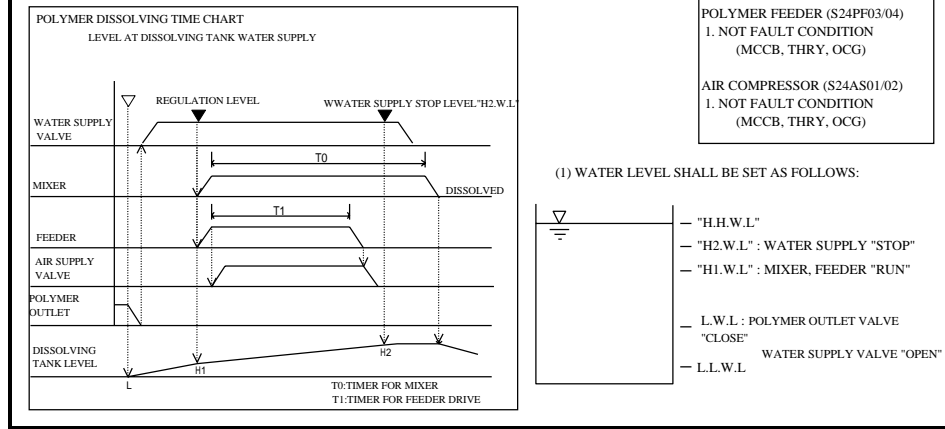
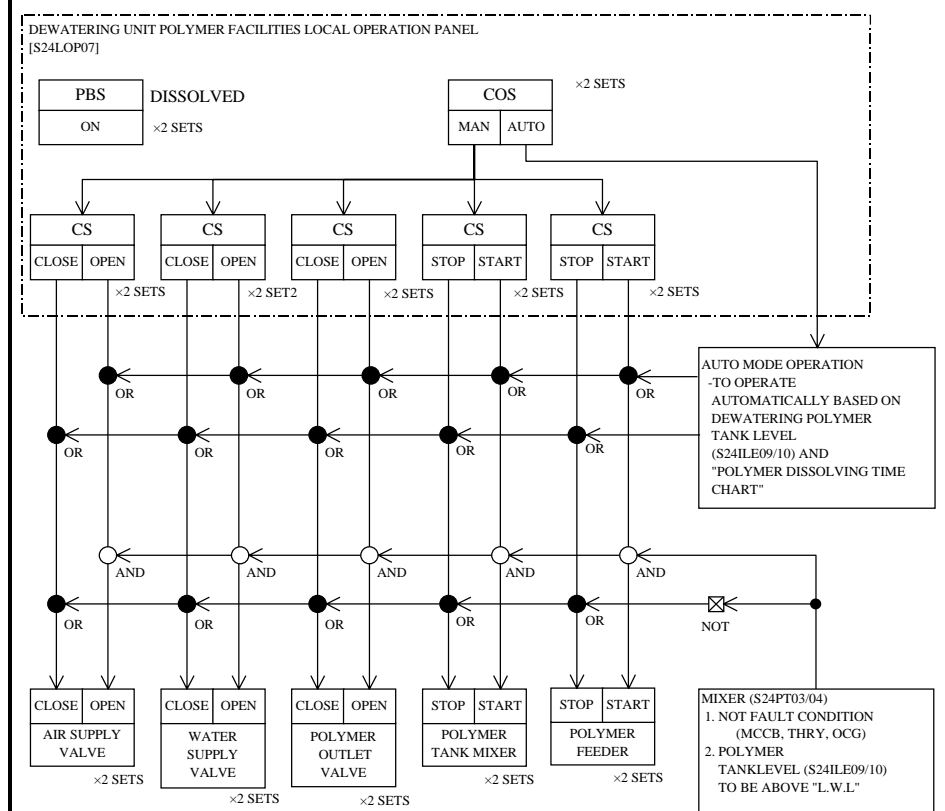
| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING (MONITORING ROOM) | | | NOTE |
|--|----------------|---|---|---|-----------|----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| LOCAL | | ○×3 | | | | | |
| REMOTE | | ○×3 | | | | | |
| START | | ○×3 | | ○×3 | | | |
| STOP | | ○×3 | | ○×3 | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| AUTO-MAN | COS | TO BE PROVIDED ON CONTROL PANEL OF MECHANICAL THICKENER | | | | | |
| START - STOP | PBS | ○×3 | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | ○ | | ○ | |
| OVER LOAD | T | ○×3 | | | | | |
| OVER CURRENT GROUND | T | ○×3 | | | | | |
| DIGESTED SLUDGE HOLDING TANK LEVEL "L.L.W.L" | T | ○ | | | | | |
| DIGESTED SLUDGE HOLDING TANK LEVEL "H.H.W.L" | T | ○ | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

| FACILITY NAME | | DEWATERING UNITS | | | ITEM | STOP CONDITION | LOCAL (SITE) | LOCAL CONTROL ROOM | ADMINISTRATION BUILDING (MONITORING ROOM) | | | NOTE | | | |
|--|---------------|------------------|------------------|----------|--|----------------|--------------|--------------------|---|-----------|-------|------|-----|-----------|----|
| TAG No. | S24DM01 to 03 | EQUIPMENT NAME | DEWATERING UNITS | CAPACITY | | | | | 3.7+1.5 kW | MECHA.DIV | MCC | | CRT | OPERATION | PR |
| DRIVE SYSTEM | | | | | | | | | | | | | | | |
| | | | | | START | | | | ○ × 3 | | | | | | |
| | | | | | STOP | | | | ○ × 3 | | | | | | |
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| | | | | | | | | | | | | | | | |
| <p>AUTO MODE OPERATION</p> <ol style="list-style-type: none"> DIGESTED SLUDGE HOLDING TANK LEVEL (S24ILE07/08) TO BE ABOVE "M.W.L"(STARTING SIGNAL) DIGESTED SLUDGE HOLDING TANK LEVEL (S24ILE07/08) TO BE ABOVE "L.W.L"(STOPPING SIGNAL) DIGESTED SLUDGE HOLDING TANK LEVEL (S24ILE07/08) TO BE ABOVE "L.L.W.L"(INTER-LOCKING SIGNAL) WASTE WATER TANK LEVEL (S24ILS03) TO BE BELOW "H.H.W.L"(INTER-LOCKING SIGNAL) POLYMER TANK LEVEL (S24ILE09/10) TO BE ABOVE "L.W.L" (STOPPING SIGNAL) POLYMER TANK LEVEL (S24ILE09/10) TO BE ABOVE "L.L.W.L" (INTER-LOCKING SIGNAL) DIGESTED DEWATERING SLUDGE FLOW (S24IFE06/0708) SIGNAL (FI 4-20 mA) TO BE GIVEN SLUDGE CAKE HOPPER FOR DIGESTED SLUDGE NOT TO BE OVERLOADED RELEVANT SLUDGE FEED PUMP (S24SP06/07/08) "RUN" RELEVANT POLYMER FEED PUMP (S24PP04/05/06) "RUN" RELEVANT SLUDGE CAKE CONVEYOR (S25CC01/02/03) "RUN" <p>COMMAND AND STATUS FROM DEWATERING UNIT</p> <ol style="list-style-type: none"> COMMAND OF "RUN" TO PERIPHERAL EQUIPMENT "RUN" AND "FAULT" CONDITION SIGNAL FROM DEWATERING UNIT | | | | | | | | | | | | | | | |
| | | | | | FAULT | | | | ○ × 3 | | ○ × 3 | | | | |
| | | | | | DIGESTED SLUDGE HOLDING TANK LEVEL "L.L.W.L" | T | | | | | | | | | |
| | | | | | POLYMER TANK LEVEL "L.L.W.L" | T | | | | | | | | | |
| | | | | | WASTE WATER TANK LEVEL "H.H.W.L" | T | | | | | | | | | |

C2-17

| | | | | | |
|---------------|--------------------------|------------------|---|----------|------------------|
| FACILITY NAME | | DEWATERING UNITS | | | |
| TAG No. | S24PT03/04 S24PF03/04 | EQUIPMENT NAME | POLYMER TANK / POLYMER FEEDER FOR DEWATERING UNIT | CAPACITY | 5.5 kW/ 0.4kW |

DRIVE SYSTEM

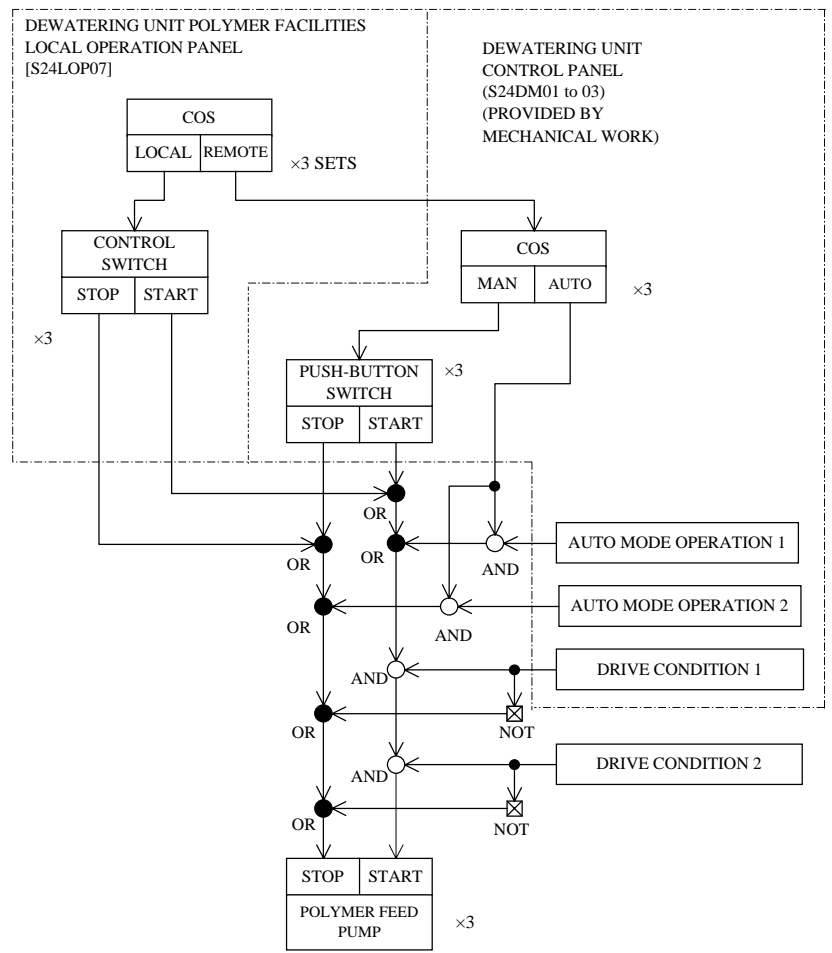


| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|------------------------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| MANUAL | | ○×2 | | | | |
| AUTO | | ○×2 | | | | |
| MIXER START | | ○×2 | | ○×2 | | |
| MIXER STOP | | ○×2 | | ○×2 | | |
| POLYMER FEEDER START | | ○×2 | | ○×2 | | |
| POLYMER FEEDER STOP | | ○×2 | | ○×2 | | |
| WATER SUPPLY VALVE FULL OPEN | | ○×2 | | | | |
| WATER SUPPLY VALVE FULL CLOSE | | ○×2 | | | | |
| AIR SUPPLY VALVE FULL OPEN | | ○×2 | | | | |
| AIR SUPPLY VALVE FULL CLOSE | | ○×2 | | | | |
| POLYMER OUTLET VALVE FULL OPEN | | ○×2 | | | | |
| POLYMER OUTLET VALVE FULL CLOSE | | ○×2 | | | | |
| DISSOLVED | | ○×2 | | | | |
| DISSOLVING | | ○×2 | | | | |
| FEEDING | | ○×2 | | | | |
| MAN - AUTO COS | | ○×2 | | | | |
| < POLYMER TANK MIXER > | | | | | | |
| START - STOP CS | | ○×2 | | | | |
| < POLYMER FEEDER > | | | | | | |
| START - STOP CS | | ○×2 | | | | |
| WATER SUPPLY VALVE OPEN-CLOSE CS | | ○×2 | | | | |
| AIR SUPPLY VALVE OPEN-CLOSE CS | | ○×2 | | | | |
| POLYMER OUTLET VALVE OPEN-CLOSE CS | | ○×2 | | | | |
| DISSOLVED PBS | | ○×2 | | | | |
| < POLYMER DISSOLVING TANK MIXER > | | | | | | |
| FAULT | | | | ○ | | ○ |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUNDING | T | ○×2 | | | | |
| < POLYMER FEEDER > | | | | | | |
| FAULT | | | | ○ | | ○ |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUNDING | T | ○×2 | | | | |
| POLYMER TANK LEVEL "H.H.W.L" | | ○×2 | | ○×2 | | ○×2 |
| POLYMER TANK LEVEL "L.L.W.L" | T | ○×2 | | ○×2 | | ○×2 |
| POLYMER TANK "ABNORMAL" | | | | | | |
| POWDER LEVEL "L.P.L" | | ○×2 | | | | |
| DISSOLVE JAM | | ○×2 | | | | |

C2-7/8

| | | | | | |
|---------------|---------------|------------------|-------------------|----------|--------|
| FACILITY NAME | | DEWATERING UNITS | | | |
| TAG No. | S24PP04 to 06 | EQUIPMENT NAME | POLYMER FEED PUMP | CAPACITY | 2.2 Kw |

DRIVE SYSTEM



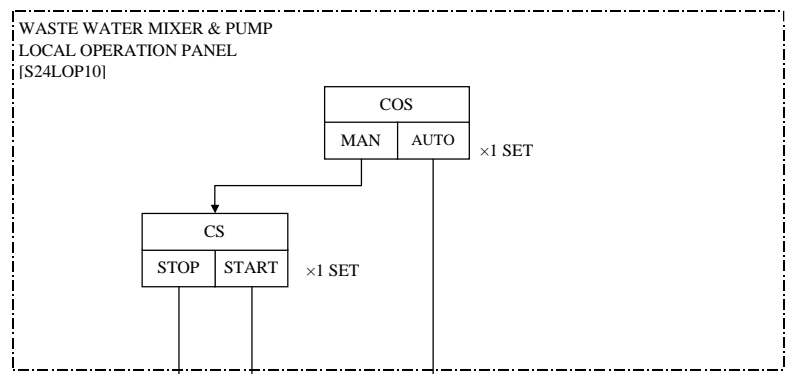
- AUTOMODE OPERATION**
- To start by the command from relevant dewatering unit (S24DM01/02/03).
 - To stop by the command from the relevant dewatering unit (S24MT01/02/03),
- DRIVE CONDITION**
- POLYMER TANK LEVEL (S24ILE09/10) TO BE ABOVE "L.L.W.L"
 - NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|--------------------------------------|----------------|---|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| LOCAL | | ○ | | | | |
| REMOTE | | ○ | | | | |
| START | | ○×3 | | ○×3 | | |
| STOP | | ○×3 | | ○×3 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| LOCAL-REMOTE | COS | ○×3 | | | | |
| MANUAL - AUT | COS | TO BE PROVIDED ON CONTROL PANEL OF MECHANICAL THICKENER | | | | |
| START - STOP | CS | ○×3 | | | | |
| DRIVE OPERATION | | | | | | |
| FAULT | | | | ○×3 | | ○×3 |
| OVER LOAD | T | ○×3 | | | | |
| OVER LOAD | T | ○×3 | | | | |
| POLYMER TANK LEVEL "L.L.W.L" | T | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |

C2-79

| | | | | | |
|---------------|---------|------------------|-------------------|----------|--------|
| FACILITY NAME | | DEWATERING UNITS | | | |
| TAG No. | S24SM07 | EQUIPMENT NAME | WASTE WATER MIXER | CAPACITY | 7.5 kW |

DRIVE SYSTEM



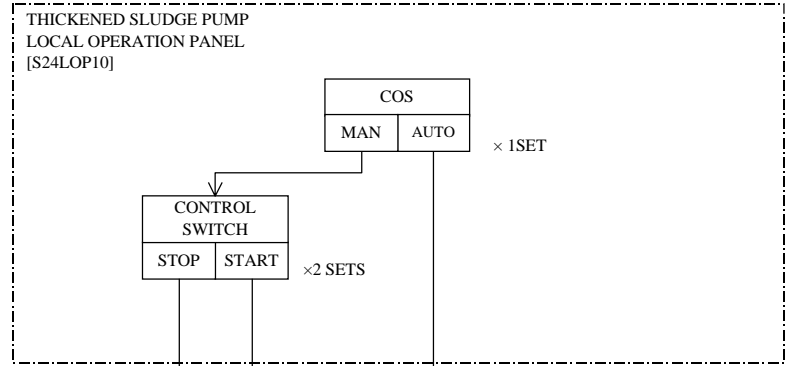
- AUTO MODE OPERATION**
- To start based on the pre-set level "M.W.L" detected by S24ILS03.
 - To stop based on the pre-set level "L.W.L" detected by S24ILS03.
- DRIVE CONDITION**
- NOT FAULT CONDITION (MCCB, THRY, OCG)
 - WASTE WATER TANK LEVEL (S24ILS03) TO BE ABOVE "L.L.W.L"

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|---|----------------|--------------|---|-----|---|----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| AUTO | | ○ | | | | | |
| MANUAL | | ○ | | | | | |
| START | | ○ | | | ○ | | |
| STOP | | ○ | | | ○ | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| MAN - AUTO | COS | ○ | | | | | |
| START - STOP | CS | ○ | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT | | | | | ○ | ○ | |
| OVER LOAD | T | ○ | | | | | |
| OVER CURRENT GROUND | T | ○ | | | | | |
| THICKENED SLUDGE HOLDING TANK LEVEL "H.H.W.L" | T | ○ | | | | | |
| THICKENED SLUDGE HOLDING TANK LEVEL "L.L.W.L" | T | ○ | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |

02-80

| | | | | | |
|---------------|------------|------------------|------------------|----------|-------|
| FACILITY NAME | | DEWATERING UNITS | | | |
| TAG No. | S24WP01/02 | EQUIPMENT NAME | WASTE WATER PUMP | CAPACITY | 22 kW |

DRIVE SYSTEM



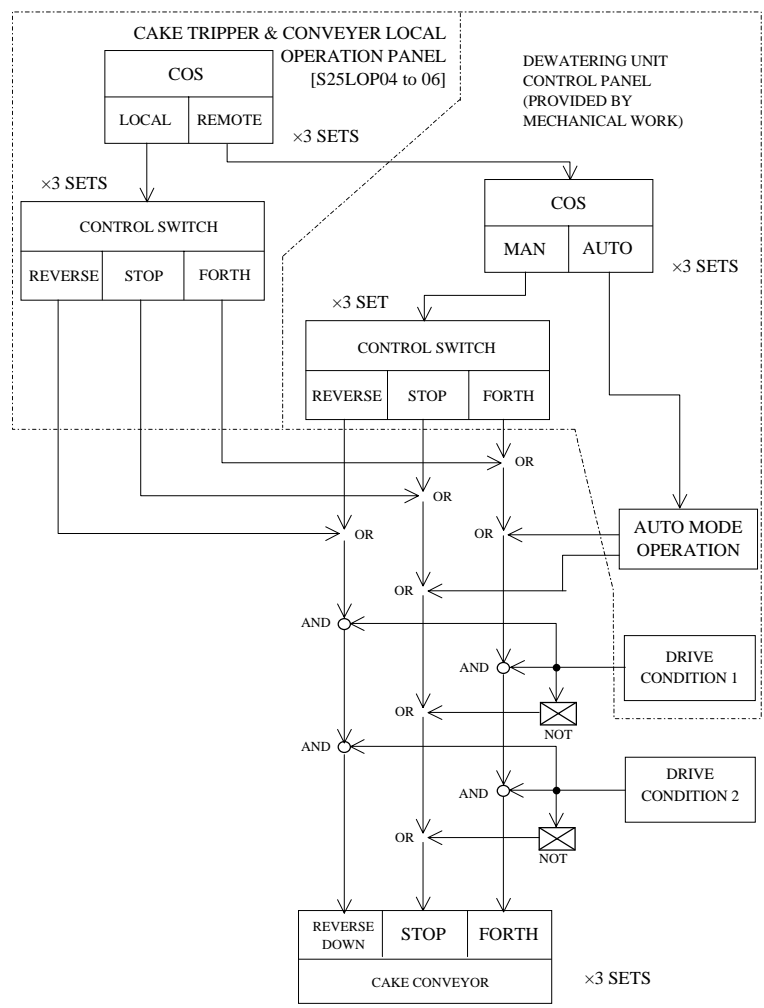
AUTO MODE OPERATION
 1. To start based on the pre-set level "M.W.L" detected by S24ILS03.
 1. To stop based on the pre-set level detected by S24ILS03.

DRIVE CONDITION
 1. WASTE WATER TANK LEVEL TO BE ABOVE "L.L.W.L" (S24ILS03).
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)
 4. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | | NOTE |
|----------------------------------|----------------|--------------|---|---|-----------|-----|------|
| | | LP | MCC | CRT | OPERATION | PR | |
| AUTO | | ○ | | | | | |
| MANUAL | | ○ | | | | | |
| START | | ○x2 | | ○x2 | | | |
| STOP | | ○x2 | | ○x2 | | | |
| MAN - AUTO | | ○ | | | | | |
| START - STOP | | ○x2 | | | | | |
| FAULT | | | | ○x2 | | ○x2 | |
| OVER LOAD | T | ○x2 | | | | | |
| OVER CURRENT GROUND | T | ○x2 | | | | | |
| WASTE WATER TANK LEVEL "L.L.W.L" | T | ○ | | | | | |

| | | | | | |
|---------------|------------|------------------|---------------|----------|--------|
| FACILITY NAME | | DEWATERING UNITS | | | |
| TAG No. | S24CC01-03 | EQUIPMENT NAME | CAKE CONVEYOR | CAPACITY | 1.5 kW |

DRIVE SYSTEM



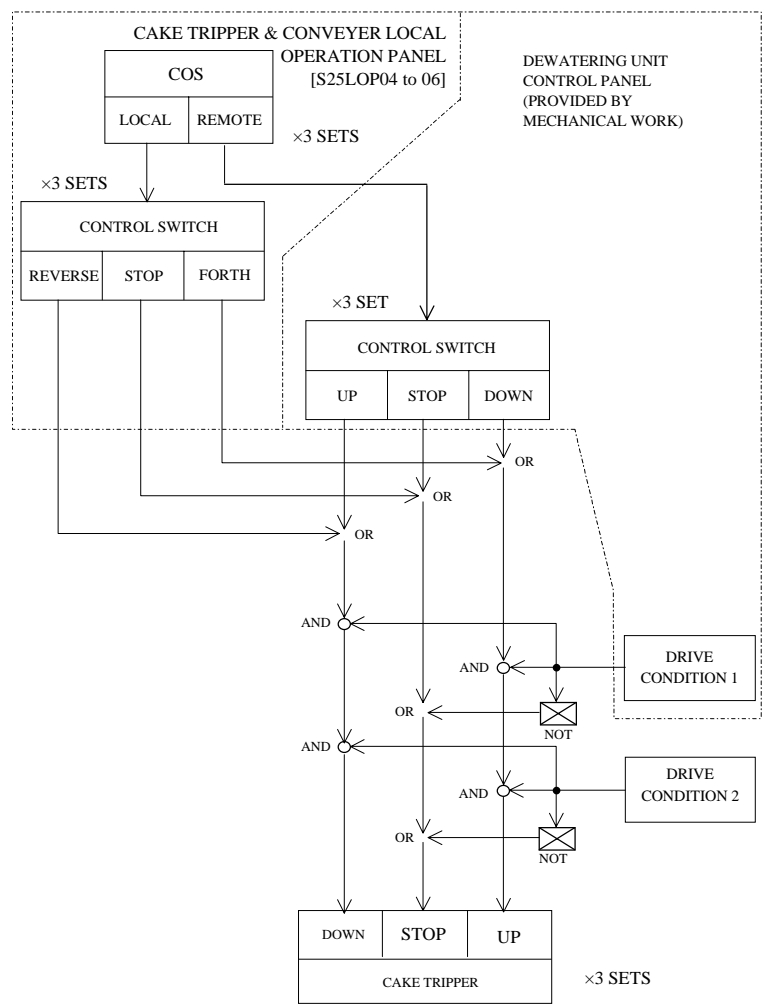
AUTO MODE OPERATION
 1. To start by the command from the relevant dewatering unit (S24DM01/02/03).
 2. To stop by the command from the relevant dewatering unit (S24DM01/02/03).

DRIVE CONDITION
 1. RELEVANT CAKE HOPPER WEIGHT (S25IWE11 to 61) TO BE BELOW "H.H.W.E"
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|------------------------------|----------------|--------------|---|---|-----------|------|
| | | LP & MECAH | MCC | CRT | OPERATION | |
| LOCAL | | ○×3 | | | | |
| REMOTE | | ○×3 | | | | |
| AUTO | | ○×3 | | | | |
| MANUAL | | ○×3 | | | | |
| REVERSE | | ○×6 | | ○×3 | | |
| STOP | | ○×6 | | ○×3 | | |
| FORTH | | ○×6 | | ○×3 | | |
| LOCAL - REMOTE | COS | ○×3 | | | | |
| MAN - AUTO | COS | ○×3 | | | | |
| REVERSE - STOP - FORTH | PBS | ○×6 | | | | |
| FAULT | | | | ○×3 | | ○×3 |
| OVER LOAD | T | ○×3 | | | | |
| OVER CURRENT GROUND | T | ○×3 | | | | |
| CAKE HOPPER WEIGHT "H.H.W.E" | T | ○×3 | | ○×3 | | ○×3 |

| | | | | | |
|---------------|------------|------------------|---------------|----------|--------|
| FACILITY NAME | | DEWATERING UNITS | | | |
| TAG No. | S25CT01-03 | EQUIPMENT NAME | CAKE CONVEYOR | CAPACITY | 1.5 kW |

DRIVE SYSTEM



AUTO MODE OPERATION
 1. To start by the command from the relevant dewatering unit (S24DM01/02/03).
 2. To stop by the command from the relevant dewatering unit (S24DM01/02/03).

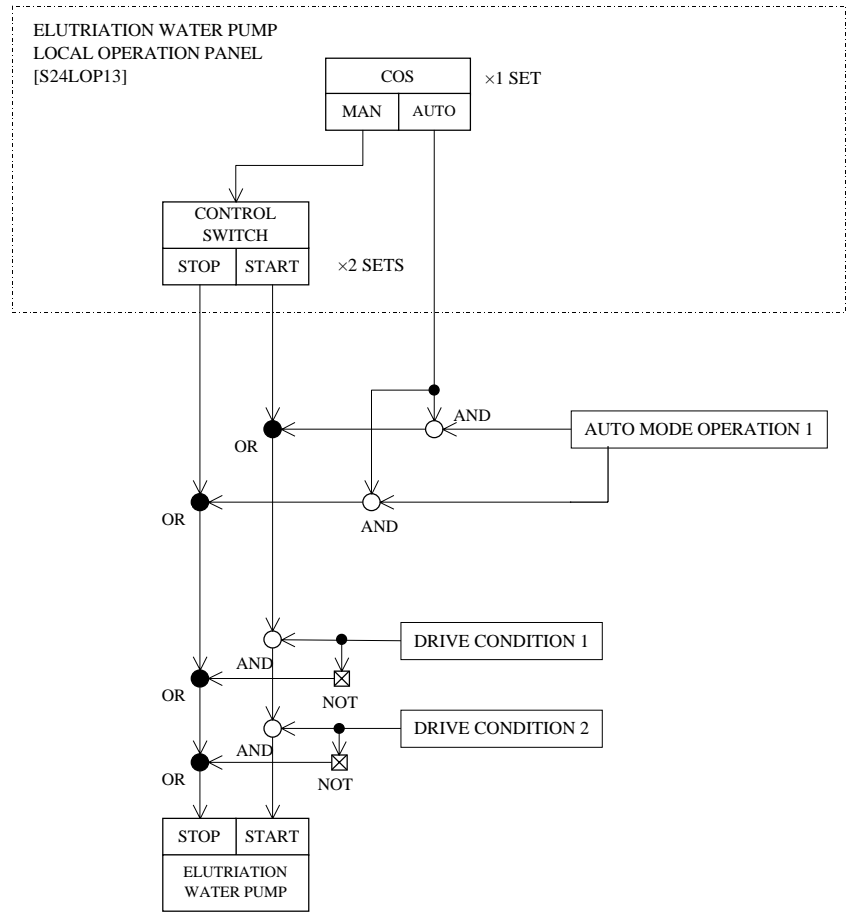
DRIVE CONDITION
 1. RELEVANT CAKE HOPPER WEIGHT (S25IWE11 to 61) TO BE BELOW "H.H.W.E"
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|------------------------------|----------------|--------------|---|---|-----------|------|
| | | | MCC | CRT | OPERATION | |
| LOCAL | | ○×3 | | | | |
| REMOTE | | ○×3 | | | | |
| AUTO | | ○×3 | | | | |
| MANUAL | | ○×3 | | | | |
| UP | | ○×6 | | ○×3 | | |
| STOP | | ○×6 | | ○×3 | | |
| DOWN | | ○×6 | | ○×3 | | |
| UPPER POSITION | | ○×3 | | | | |
| LOWER POSITION | | ○×3 | | | | |
| LOCAL - REMOTE | COS | ○×3 | | | | |
| MAN - AUTO | COS | ○×3 | | | | |
| UP - STOP - DOWN | PBS | ○×6 | | | | |
| FAULT | | | | ○×3 | | ○×3 |
| OVER LOAD | T | ○×3 | | | | |
| OVER CURRENT GROUND | T | ○×3 | | | | |
| CAKE HOPPER WEIGHT "H.H.W.E" | T | ○×3 | | ○×3 | | ○×3 |

| FACILITY NAME | | DEWATERING UNITS | | | | ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|---|--------|------------------|----------------------------------|----------|------------|-------------------------------|----------------|--------------|---|---|-----------|------|
| TAG No. | M9-005 | EQUIPMENT NAME | SLUDGE CAKE HOPPER (RIGHT) (2/2) | CAPACITY | 2.2+2.2 kW | | | LP | MCC | CRT | OPERATION | |
| DRIVE SYSTEM | | | | | | | | | | | | |
| <div style="border: 1px dashed black; padding: 10px;"> <p style="text-align: center;">CAKE HOPPER LOCAL OPERATION PANEL [S25LOP01 to 03]</p> <p style="text-align: center;">RIGHT SIDE ONLY</p> </div> | | | | | | DRIVE / CONDITION INDICATIONS | ○×6 | | ○×6 | | | |
| | | | | | | DRIVE OPERATION | | ○×6 | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | ○×6 | ○×6 | |
| <p>DRIVE CONDITION</p> <ol style="list-style-type: none"> Opening directional L S (Limit Switch) and closing directional not to be actuated during opening and closing respectively Opening directional TS (Torque limit switch) and closing directional TS not to be actuated during opening and closing respectively NOT FAULT CONDITION (MCCB, THRY, OCG) | | | | | | | | | | | | |

| | | | | | |
|---------------|------------|--------------------------|------------------------|----------|--------|
| FACILITY NAME | | UTILITY WATER FACILITIES | | | |
| TAG No. | S24OP01/02 | EQUIPMENT NAME | ELUTRIATION WATER PUMP | CAPACITY | 3.7 kW |

DRIVE SYSTEM



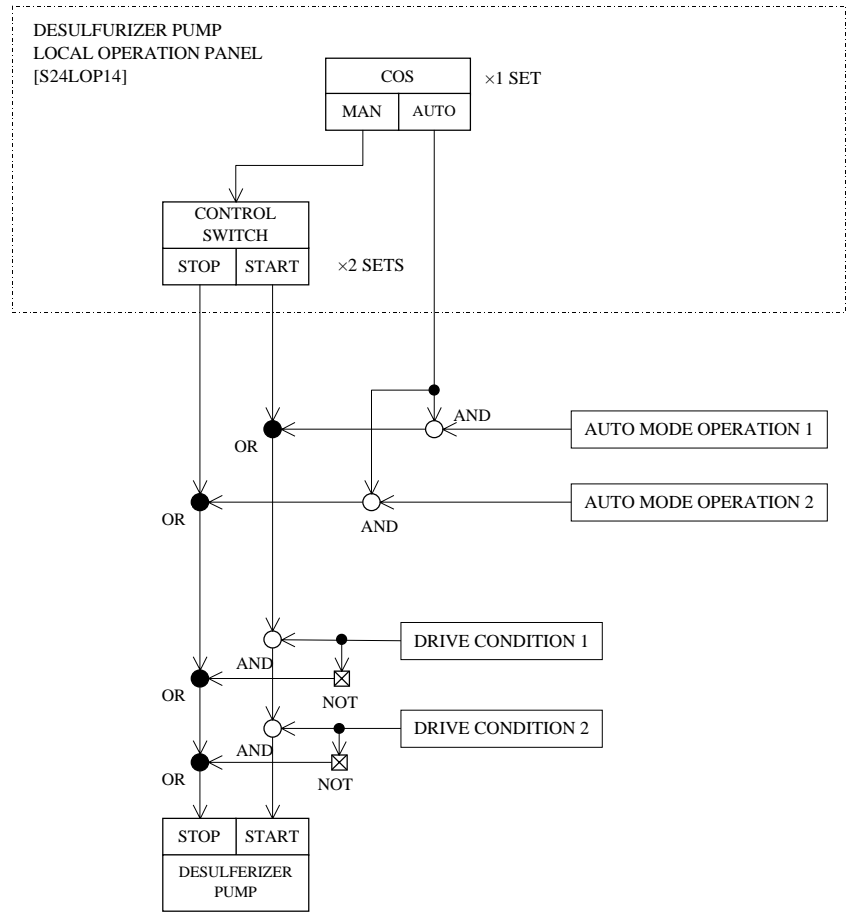
AUTO MODE OPERATION
 1. To operate in accordance with the odor fan (S24EX01/02)

DRIVE CONDITION
 1. TREATED WATER TANK LEVEL (S24ILS01) TO BE ABOVE "L.L.W.L"
 2. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|------------------------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| AUTO | | ○ | | | | |
| MANUAL | | ○ | | | | |
| No.1 | | ○ | | | | |
| AUTO | | ○ | | | | |
| No.1 | | ○ | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| MAN - AUTO | COS | ○ | | | | |
| No.1 - AUTO - No.2 | COS | ○ | | | | |
| START - STOP | CS | ○×2 | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | |
| TREATED WATER TANK LEVEL "H.H.W.L" | | ○ | | ○ | | ○ |
| TREATED WATER TANK LEVEL "L.L.W.L" | T | ○ | | ○ | | ○ |

| | | | | | |
|---------------|------------|--------------------------|-------------------|----------|-------|
| FACILITY NAME | | UTILITY WATER FACILITIES | | | |
| TAG No. | S24VP01/02 | EQUIPMENT NAME | DESULFURIZER PUMP | CAPACITY | 45 kW |

DRIVE SYSTEM



AUTO MODE OPERATION

- To start based on the pre-set pressure level "M.P.L" of the digester detected by S23IPE11/21.
- To stop based on the pre-set pressure level "L.P.L" of the digester detected by S23IPE11/21

DRIVE CONDITION

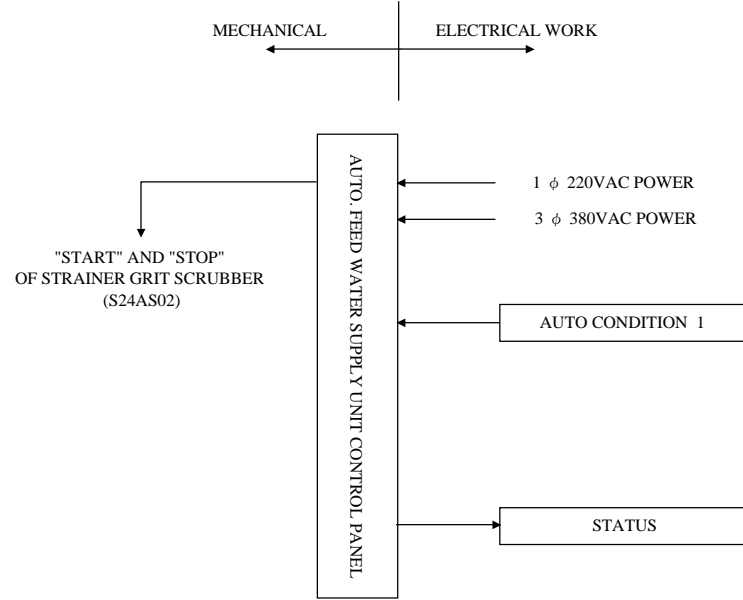
- TREATED WATER TANK LEVEL (S24ILS01) TO BE ABOVE "L.L.W.L"
- NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|--------------------------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| AUTO | | ○ | | | | |
| MANUAL | | ○ | | | | |
| No.1 | | ○ | | | | |
| AUTO No.1 | | ○ | | | | |
| AUTO No.1 | | ○ | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| MAN - AUTO | COS | ○ | | | | |
| No.1 - AUTO - No.2 | COS | ○ | | | | |
| START - STOP | CS | ○×2 | | | | |
| DRIVE OPERATION | | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | |
| TREATED WATER TANK LEVEL "H.H.W.L" | | ○ | | ○ | | ○ |
| TREATED WATER TANK LEVEL "L.L.W.L" | T | ○ | | ○ | | ○ |

| FACILITY NAME | | UTILITY WATER FACILITIES | | | | ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | | NOTE | |
|--|---------|--------------------------|------------------------|----------|--------|------------------------------------|----------------|--------------|---|---|--------------------------|----|------|--|
| TAG No. | S24AS01 | EQUIPMENT NAME | STRAINER ODOR SCRUBBER | CAPACITY | 0.4 kW | | | MECHA.DIV | MCC | CRT | OPERATION | PR | | |
| DRIVE SYSTEM | | | | | | | | | | | | | | |
| | | | | | | DRIVE / CONDITION INDICATIONS | | | | | | | | |
| | | | | | | DRIVE OPERATION | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | |
| AUTO CONDITION 1 1. TREATED WATER TANK LEVEL (S24ILS01) TO BE ABOVE "L.W.L" (STOPPING SIGNAL) 2. TREATED WATER TANK LEVEL (S24ILS01) TO BE ABOVE "L.L.W.L" (INTERLOCKING SIGNAL) | | | | | | FAULT | | | | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| STATUS FROM AUTO. FEED WATER SUPPLY UNIT 1. "RUN" OR "FAULT" CONDITION SIGNAL FROM STRAINER ODOR SCRUBBER | | | | | | TREATED WATER TANK LEVEL "L.L.W.L" | T | | | | | | | |
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| FACILITY NAME | | UTILITY WATER FACILITIES | | | | ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | | NOTE | | | | |
|--|------------|--------------------------|-------------------|----------|-------|-------------------------------------|-------------------|-----------------|--|--|-----------|----|------|--|--|--|--|
| TAG No. | S24SU01/02 | EQUIPMENT NAME | WATER SUPPLY UNIT | CAPACITY | 15 kW | | | MECHA.DIV | MCC | CRT | OPERATION | PR | | | | | |
| DRIVE SYSTEM | | | | | | | | | | | | | | | | | |
| <p>AUTO CONDITION 1 1. UTILITY WATER TANK LEVEL (S24ILS02) TO BE ABOVE "L.W.L." (STOPPING SIGNAL) 2. UTILITY WATER TANK LEVEL (S24ILS02) TO BE ABOVE "L.L.W.L." (INTER-LOCKING SIGNAL)</p> <p>AUTO CONDITION 2 1. PRESSURE IN THE TANK TO BE ABOVE "L.P." (STARTING SIGNAL) 2. PRESSURE IN THE TANK TO BE BELOW "H.P." (STOPPING SIGNAL)</p> <p>STATUS FROM AUTO. FEED WATER SUPPLY UNIT 1. "RUN" OR "FAULT" CONDITION SIGNAL FROM WATER SUPPLY UNIT</p> | | | | | | START | | | | | | | | | | | |
| | | | | | | STOP | | | | | | | | | | | |
| | | | | | | DRIVE / CONDITION INDICATIONS | | | | | | | | | | | |
| | | | | | | DRIVE OPERATION | | | | | | | | | | | |
| | | | | | | FAULT | | | | | | | | | | | |
| | | | | | | FAULT / ABNORMAL INDICATIONS | | | | | | | | | | | |
| | | | | | | UTILITY WATER TANK LEVEL "L.L.W.L." | | | | | | T | | | | | |
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|---------------|---------|--------------------------|------------------------|----------|--------|
| FACILITY NAME | | UTILITY WATER FACILITIES | | | |
| TAG No. | S24AS02 | EQUIPMENT NAME | STRAINER GRIT SCRUBBER | CAPACITY | 0.4 kW |
| DRIVE SYSTEM | | | | | |



AUTO CONDITION 1
 1. TREATED WATER TANK LEVEL (S24ILS01) TO BE ABOVE "L.W.L" (STOPPING SIGNAL)
 2. TREATED WATER TANK LEVEL (S24ILS01) TO BE ABOVE "L.L.W.L" (INTERLOCKING SIGNAL)

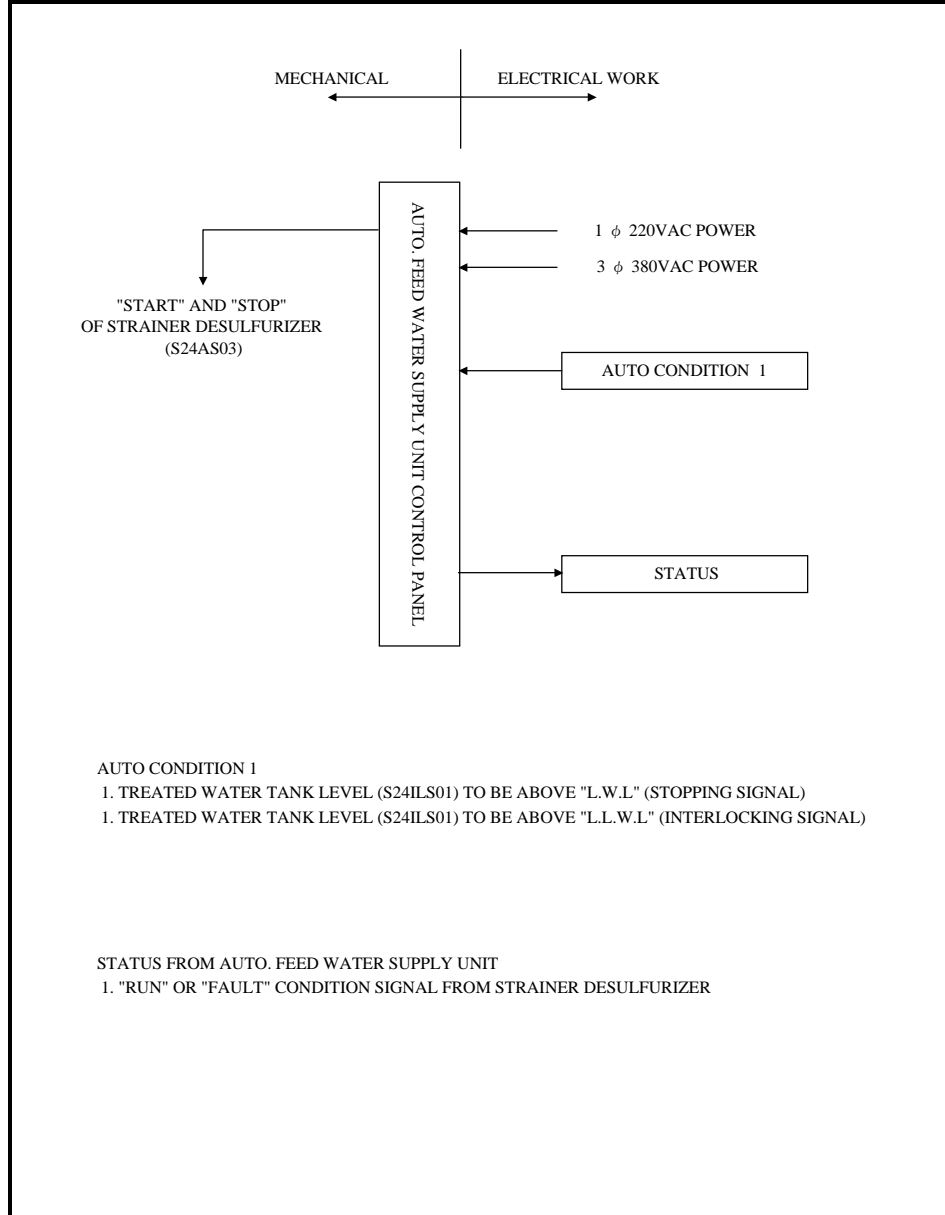
STATUS FROM AUTO. FEED WATER SUPPLY UNIT
 1. "RUN" OR "FAULT" CONDITION SIGNAL FROM STRAINER GRIT SCRUBBER

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | | NOTE |
|------------------------------------|----------------|--------------|---|---|-----------|--------------------------|--------------------------|
| | | MECHA.DIV | MCC | CRT | OPERATION | PR | |
| START | | | | | | <input type="checkbox"/> | |
| STOP | | | | | | <input type="checkbox"/> | |
| DRIVE / CONDITION INDICATIONS | | | | | | | |
| DRIVE OPERATION | | | | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | | |
| FAULT | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| TREATED WATER TANK LEVEL "L.L.W.L" | T | | | | | | |

C2-90

| FACILITY NAME | | UTILITY WATER FACILITIES | | | |
|---------------|---------|--------------------------|------------------------|----------|--------|
| TAG No. | S24AS03 | EQUIPMENT NAME | STRAINER GRIT SCRUBBER | CAPACITY | 0.4 kW |

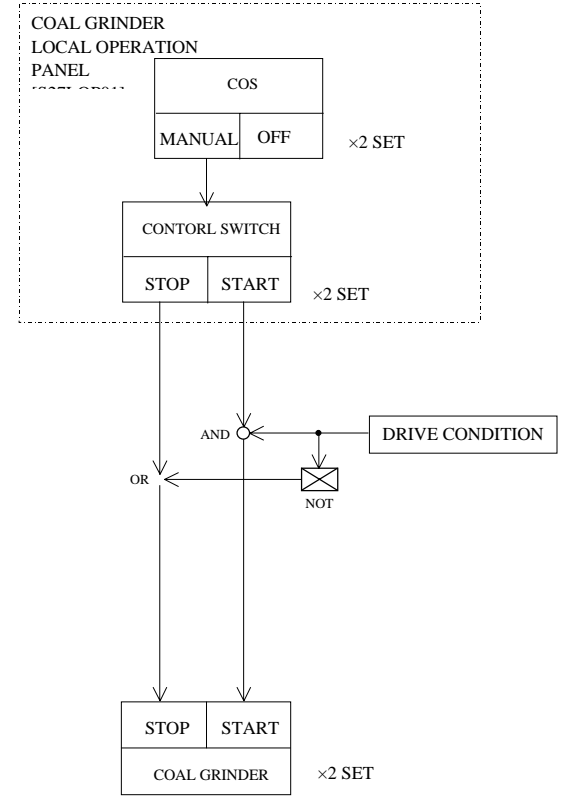
DRIVE SYSTEM



| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | | NOTE |
|------------------------------------|----------------|-------------------------------|---|---|-----------|----|------|
| | | MECHA.DIV | MCC | CRT | OPERATION | PR | |
| | | DRIVE / CONDITION INDICATIONS | | | | | |
| START | | | | ○ | | | |
| STOP | | | | ○ | | | |
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| DRIVE OPERATION | | | | | | | |
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| FAULT / ABNORMAL INDICATIONS | | | | | | | |
| FAULT | | | | ○ | | ○ | |
| TREATED WATER TANK LEVEL "L.L.W.L" | T | | | | | | |
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|---------------|------------|----------------|--------------|----------|-------|
| FACILITY NAME | | BOILER HOUSE | | | |
| TAG No. | S27CG01/02 | EQUIPMENT NAME | COAL GRINDER | CAPACITY | 11 kW |

DRIVE SYSTEM

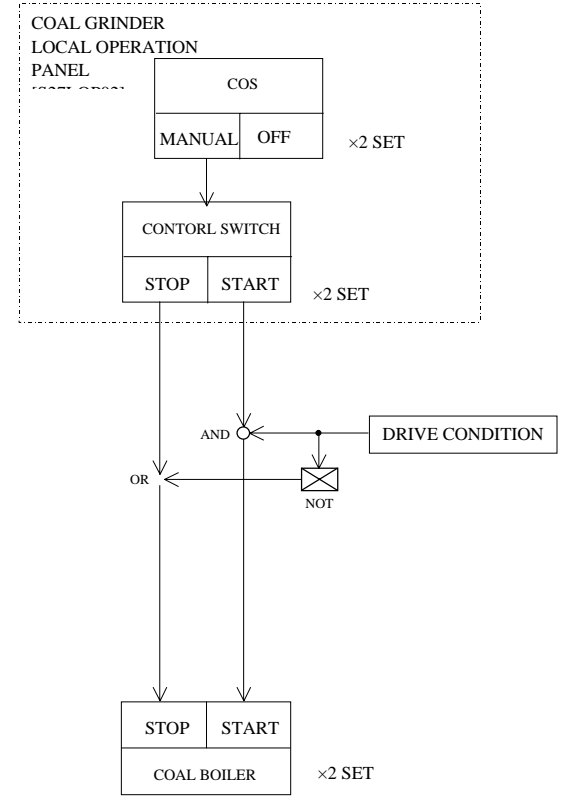


DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|---------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| MANUAL | | ○×2 | | | | |
| OFF | | ○×2 | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| START - STOP | CS | ○×2 | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | |

| | | | | | |
|---------------|------------|----------------|-------------|----------|-------|
| FACILITY NAME | | BOILER HOUSE | | | |
| TAG No. | S27CB01/02 | EQUIPMENT NAME | COAL BOILER | CAPACITY | 11 kW |

DRIVE SYSTEM

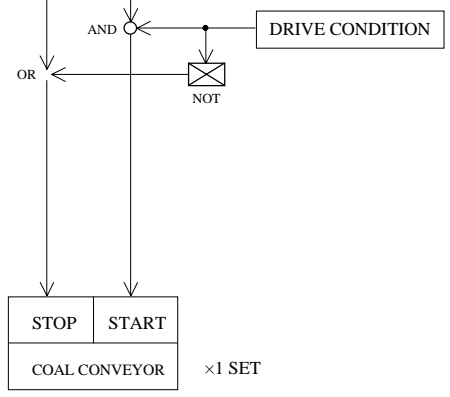
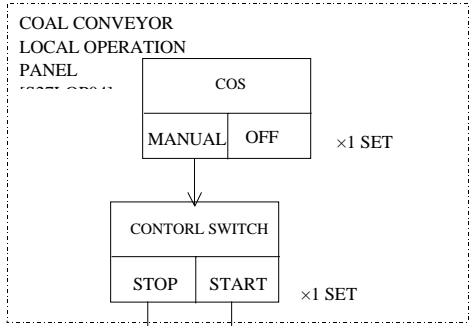


DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| MANUAL | | ○×2 | | | | |
| OFF | | ○×2 | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| START - STOP | CS | ○×2 | | | | |
| DRIVE OPERATION | | | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |

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|---------------|---------|----------------|---------------|----------|-------|
| FACILITY NAME | | BOILER HOUSE | | | |
| TAG No. | S27CC01 | EQUIPMENT NAME | COAL CONVEYOR | CAPACITY | 11 kW |

DRIVE SYSTEM

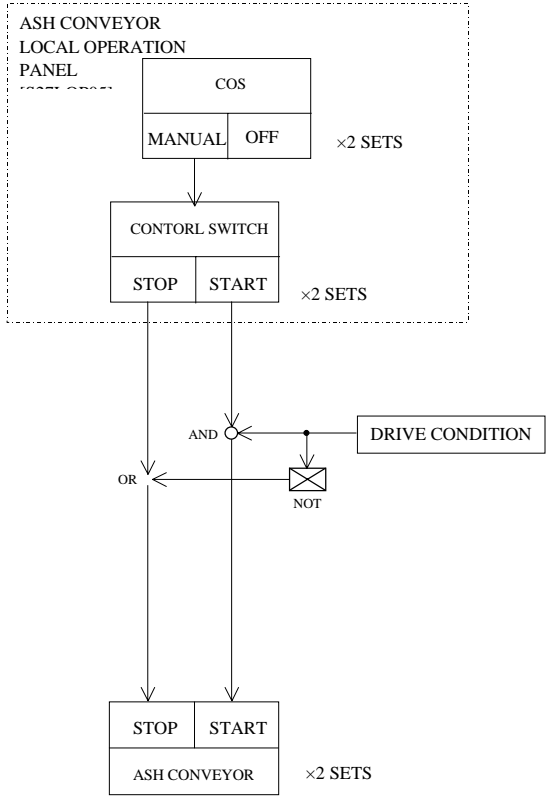


DRIVE CONDITION
 1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE | | | | | | | |
|-------------------------------|----------------|--------------|---|---|-----------|------|---------------------|---|---|--|---|--|---|
| | | LP | MCC | CRT | OPERATION | | PR | | | | | | |
| DRIVE / CONDITION INDICATIONS | | | | | | | MANUAL | | ○ | | | | |
| | | | | | | | OFF | | ○ | | | | |
| | | | | | | | START | | ○ | | ○ | | |
| | | | | | | | STOP | | ○ | | ○ | | |
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| DRIVE OPERATION | | | | | | | START - STOP CS | | ○ | | | | |
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| FAULT / ABNORMAL INDICATIONS | | | | | | | FAULT | | | | ○ | | ○ |
| | | | | | | | OVER LOAD | T | ○ | | | | |
| | | | | | | | OVER CURRENT GROUND | T | ○ | | | | |
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|---------------|------------|----------------|--------------|----------|--------|
| FACILITY NAME | | BOILER HOUSE | | | |
| TAG No. | S27A001/02 | EQUIPMENT NAME | ASH CONVEYOR | CAPACITY | 1.5 kW |

DRIVE SYSTEM

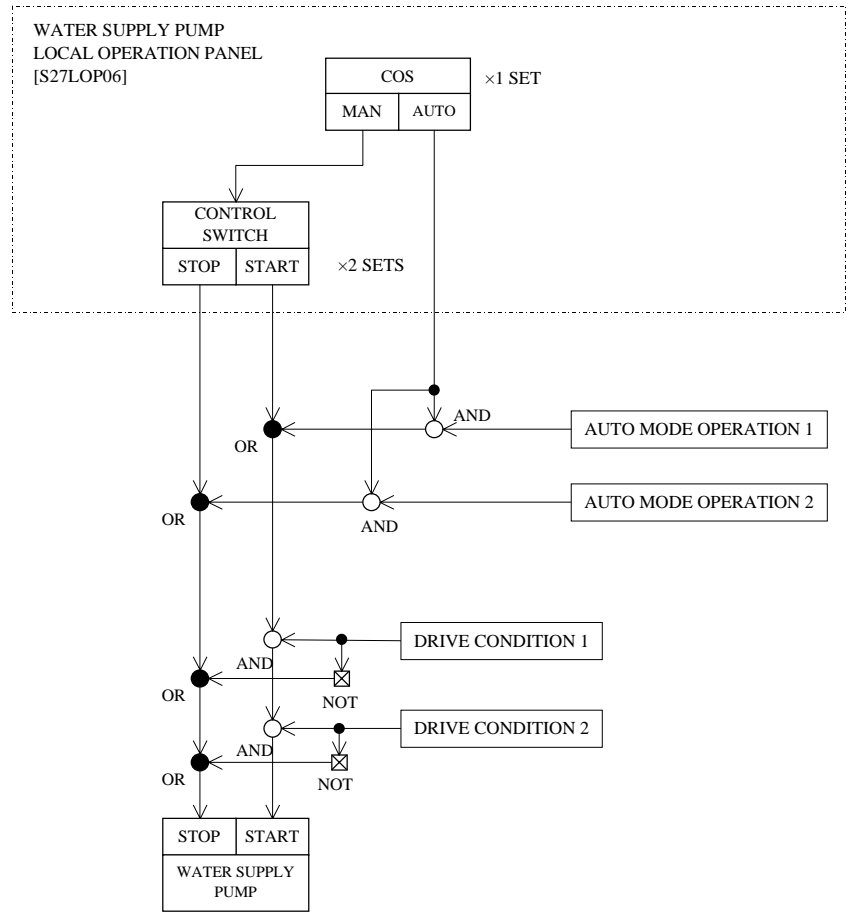


DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|-------------------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| MANUAL | | ○ | | | | |
| OFF | | ○ | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| DRIVE / CONDITION INDICATIONS | | | | | | |
| START - STOP | CS | ○×2 | | | | |
| DRIVE OPERATION | | | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | |
| FAULT / ABNORMAL INDICATIONS | | | | | | |

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|---------------|------------|----------------|-------------------|----------|--------|
| FACILITY NAME | | BOILER HOUSE | | | |
| TAG No. | S27SP01/02 | EQUIPMENT NAME | WATER SUPPLY PUMP | CAPACITY | 5.5 kW |

DRIVE SYSTEM



AUTO MODE OPERATION

- To start based on the pre-set water level "M.W.L" of the condenser detected by S27ILE01.
- To stop based on the pre-set water level "L.W.L" of the condenser detected by S27ILE01.

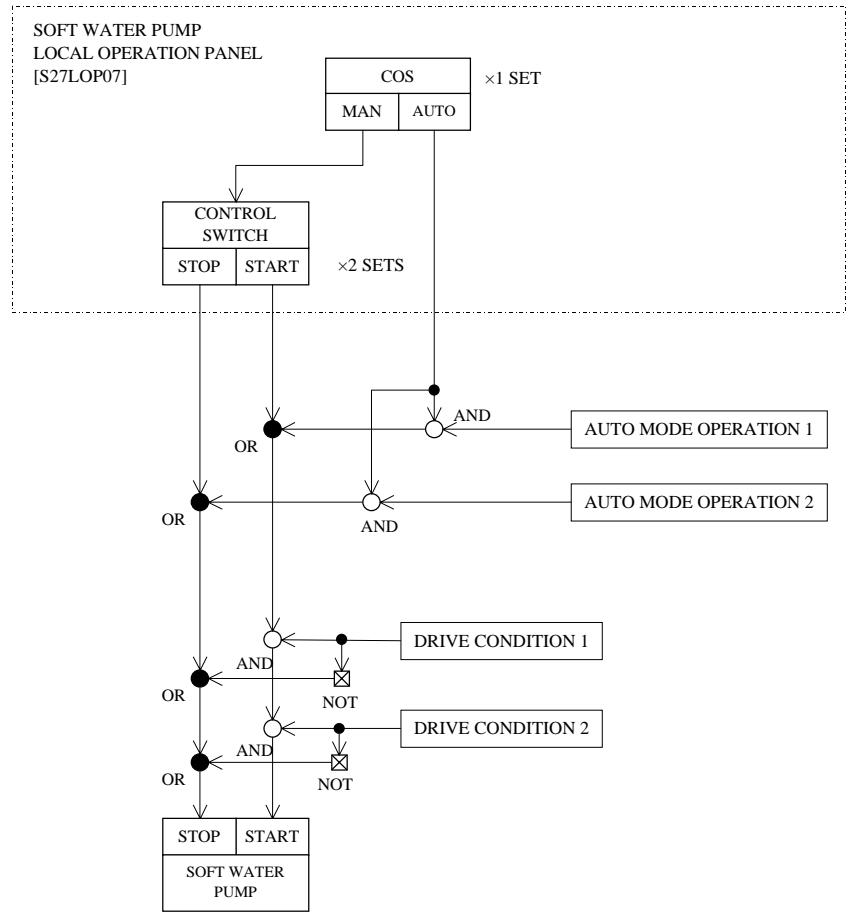
DRIVE CONDITION

- NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|---------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| AUTO | | ○ | | | | |
| MANUAL | | ○ | | | | |
| No.1 | | ○ | | | | |
| AUTO | | ○ | | | | |
| No.1 | | ○ | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| MAN - AUTO | COS | ○ | | | | |
| No.1 - AUTO - No.2 | COS | ○ | | | | |
| START - STOP | CS | ○×2 | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | |

| | | | | | |
|---------------|------------|----------------|-----------------|----------|-------|
| FACILITY NAME | | BOILER HOUSE | | | |
| TAG No. | S27SP03/04 | EQUIPMENT NAME | SOFT WATER PUMP | CAPACITY | 45 kW |

DRIVE SYSTEM



AUTO MODE OPERATION

- To start based on the pre-set water level "M.W.L" of the boiler detected by S27ILE11/21.
- To stop based on the pre-set water level "L.W.L" of the condenser detected by S27ILE11/21.

DRIVE CONDITION

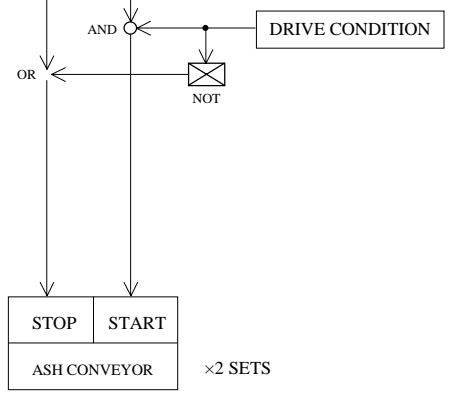
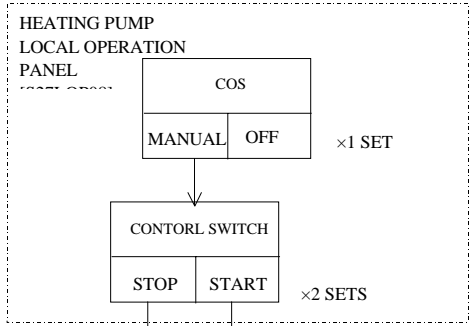
- NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|---------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| AUTO | | ○ | | | | |
| MANUAL | | ○ | | | | |
| No.1 | | ○ | | | | |
| AUTO | | ○ | | | | |
| No.1 | | ○ | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| MAN - AUTO | COS | ○ | | | | |
| No.1 - AUTO - No.2 | COS | ○ | | | | |
| START - STOP | CS | ○×2 | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | |

C2-99

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|---------------|------------|----------------|--------------|----------|-------|
| FACILITY NAME | | BOILER HOUSE | | | |
| TAG No. | S27SP05/06 | EQUIPMENT NAME | HEATING PUMP | CAPACITY | 11 kW |

DRIVE SYSTEM



DRIVE CONDITION
1. NOT FAULT CONDITION (MCCB, THRY, OCG)

| ITEM | STOP CONDITION | LOCAL (SITE) | SLUDGE TREATMENT BUILDING ELECTRICAL ROOM | SLUDGE TREATMENT BUILDING MONITORING ROOM | | NOTE |
|---------------------|----------------|--------------|---|---|-----------|------|
| | | LP | MCC | CRT | OPERATION | |
| MANUAL | | ○ | | | | |
| OFF | | ○ | | | | |
| START | | ○×2 | | ○×2 | | |
| STOP | | ○×2 | | ○×2 | | |
| START - STOP | CS | ○×2 | | | | |
| FAULT | | | | ○×2 | | ○×2 |
| OVER LOAD | T | ○×2 | | | | |
| OVER CURRENT GROUND | T | ○×2 | | | | |

C2-100