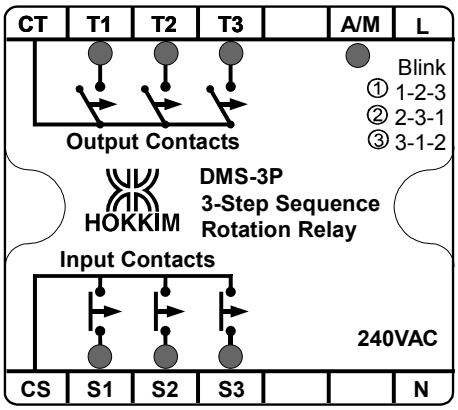
HOKKIM *giving you control* Control & Protection Relays

Program: DMS-3P 3-Step Sequence Rotation Relay

Operation: This program is used to control the rotation of 3 air compressors.

Supply: L-N 240VAC
Inputs: CS-S1-S2-S3 (Use only volt-free contacts)
CS-S1 Level 1 - 1st Air Compressor (Highest Pressure Cut Off)
CS-S2 Level 2 - 2nd Air Compressor
CS-S3 Level 3 - 3rd Air Compressor (Lowest Pressure Cut Off)
CS-A/M Auto / Hold / Manual Sequence Change
Outputs: CT-T1-T2-T3 (Volt-free contacts rating: 5A 240VAC)
CS-T1 Air Compressor 1
CS-T2 Air Compressor 2
CS-T3 Air Compressor 3



(1) Only volt-free contacts should be used to signal inputs.
(2) On power on, with all inputs opened, all outputs will stay opened.
(3) When CS-S1 closes, the 1st Air Compressor will start. When CS-S1 opens, the 1st Air Compressor will stop. Whichever compressor is the 1st depends on the Sequence in effect. When Sequence 1 is in effect, the 1st compressor is T1. When Sequence 2 is in effect, the 1st compressor is T2. When Sequence 3 is in effect, the 1st compressor is T3, etc. Similarly CS-S2 controls the 2nd Air Compressor, CS-S3 controls the 3rd Air Compressor and so on. The table below shows the relation between the sequence number and the compressors.

Sequence	1st A/C	2nd A/C	3rd A/C
1	T1	T2	T3
2	T2	T3	T1
3	T3	T1	T2

(5) Input signals are given through the closing and opening of the input contacts. Sequence change occurs when the input signals change from the closing of contacts to the opening of contacts. That is, sequence change occurs when there is an input contacts opening event following after an input contacts closing event. A few examples will clarify this:
In the following, the 1st box refers to T1, the 2nd T2 and 3rd T3. A ✓ represents contacts closed and a × represents contacts opened.

(a) Start Sequence 1 (T1-T2-T3)

×	×	×

CS-S1 closes; sequence remains the same;

✓	×	×

CS-S1 opens; sequence changes (T2-T3-T1);

×	×	×

CS-S1 closes; sequence remains the same;

×	✓	×

CS-S1 opens; sequence changes (T3-T1-T2);

×	×	×

CS-S1 closes; sequence remains the same;

×	×	✓

(b) Start Sequence 1 (T1-T2-T3)

×	×	×

CS-S1 closes; sequence remains the same;

✓	×	×

CS-S2 closes; sequence remains the same;

✓	✓	×

CS-S2 opens; sequence changes (T2-T3-T1);

×	✓	×

CS-S1 opens; sequence remains the same;

×	×	×

CS-S1 closes; sequence remains the same;

×	✓	×

CS-S2 closes; sequence remains the same;

×	✓	✓

CS-S2 opens; sequence changes (T3-T1-T2);

×	×	✓

CS-S2 closes; sequence remains the same;

✓	×	✓

CS-S2 opens; sequence changes (T1-T2-T3);

✓	×	×

(c) Start Sequence 1 (T1-T2-T3)

×	×	×

CS-S1 closes; sequence remains the same;

✓	×	×

CS-S2 closes; sequence remains the same;

✓	✓	×

CS-S3 closes; sequence remains the same;

✓	✓	✓

CS-S3 opens; sequence changes (T2-T3-T1);

×	✓	✓

CS-S2 opens; sequence remains the same;

×	✓	×

CS-S1 opens; sequence remains the same;

×	×	×

CS-S1 opens; sequence remains the same;

×	✓	×

CS-S2 opens; sequence remains the same;

×	✓	✓

CS-S3 closes; sequence remains the same;

✓	✓	✓

CS-S3 opens; sequence changes (T3-T1-T2);

✓	×	✓

CS-S3 closes; sequence remains the same;

✓	✓	✓

CS-S3 opens; sequence changes (T1-T2-T3);

✓	✓	×

+(6) The input signal must be present continuously for 1 sec. before the ouput contacts will close. This is to prevent false trigger. Also, if for any reason all six input signals are present simultaneously, there will be 10 sec. intervals between the closing of the output contacts. The delay intervals are to prevent excessively high transient currents.

(7) Upon power failure, the sequence will reset to T1-T2-T3. The DMS-3P is based on a microcontroller whose embedded program will always reset upon power up. If you have to maintain the sequence upon mains failure, battery backup power must be used to maintain supply to the DMS-3P.