TECHNICAL BULLETIN

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[Title] Acquirement of DNV Certificate and Relevant Restrictions **[Date of Issue]** Jun, '07

[Relevant Models] DNV-Certificated MELSEC-A/AnS/QnA (including Q4AR)/QnAS Series Models

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Thank you for your continuous patronage to Mitsubishi programmable controllers, MELSEC- A/AnS/QnA (including Q4AR)/QnAS series.

We are pleased to inform that the MELSEC- A/AnS/QnA (including Q4AR)/QnAS series has acquired the Type Approval Certificate on programmable electric system models from DNV (Det Norske Veritas), based on new rules set forth in 2001 (IACS UR E10 Ver. 3/2001).

In the IACS UR E10 Ver. 3, some stringent restrictions, such as emission of 24dB or less (@3m) in a frequency range from 156 to 165MHz, have been newly added. However, the globally accredited organization, DNV (Det Norske Veritas) has approved that the MELSEC-A/AnS/QnA (including Q4AR)/QnAS series satisfy the requirements.

The following is the details of the DNV certificate:

Item	Description
Accreditation organization	Det Norske Veritas
Certificate No.	A-10322 MELSEC-AnS/QnAS series
	A-10321 MELSEC-A/QnA (including Q4AR) series
Category	Programmable Electric System
Rules	Environmental test specific for instrument and automation equipment standard for certification No. 2.4 April 2001 (International Association of Classification Societies' Unified Requirements (IACS UR) E10 Ver.3)
Term of validity	Effective until Dec. 31, 2009

Item	Class	Remarks
Temperature	A	5 to 55℃
Humidity	B	Less than 100%
Vibration	A	0.7G (13.2 to 100Hz)
EMC	A	Any given place on vessel (Except for bridge)
Enclosure	-	Refer to the restrictions.

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When using the MELSEC-A/AnS/QnA(including Q4AR/QnAS series as a DNV-accredited system, please refer to the following table and observe the corresponding restrictions.

○: Applied

Restriction No.		MELSEC-A	MELSEC-AnS	MELSEC-QnA	MELSEC-QnAS	MELSEC-Q4AR
1	(1)	○	○	○	○	○
	(2)	—	—	—	—	○
2		○	○	○	○	○
3		○	○	○	○	—
4		—	—	—	—	○
5		○	○	○	○	○

1. Control panel

(1) MELSEC-A A/AnS/QnA (including Q4AR)/QnAS series

(a) The control panel must be conductive.

(b) When fixing a top or bottom plate of the control panel with bolts, remove the coating of the fixing part so that both exposed surfaces will come into contact.

(c) When using an inner plate, ensure electric contact with the control panel. Remove the coating of the bolt-fixing rea of both the inner plate and control panel to ensure conductivity in the largest area as possible.

(d) Ground the control panel with a thick ground cable (Cross-sectional area: 2 mm^2 or more).

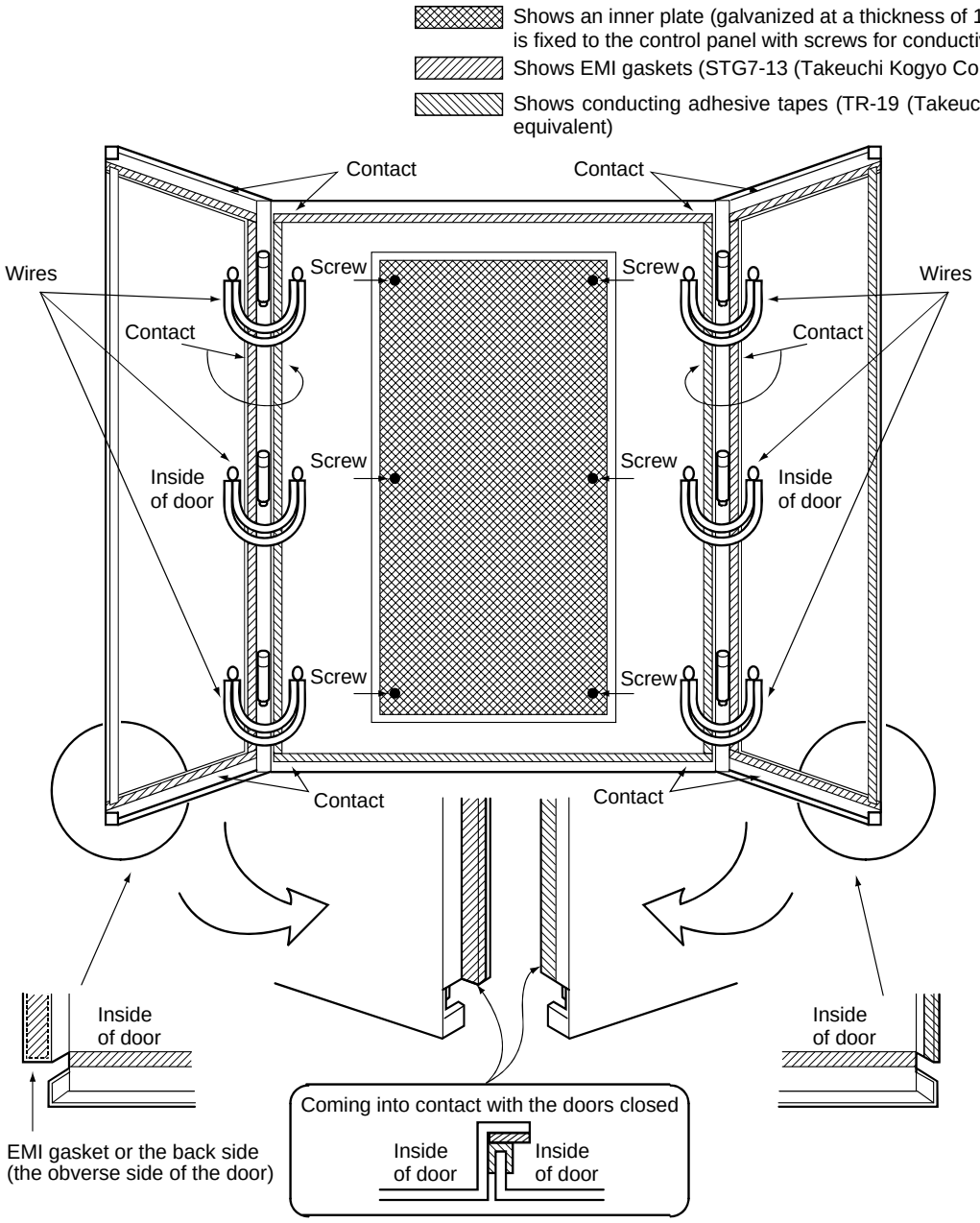
(e) The diameter of cable holes in the control panel must be 10cm or less.
Eliminate space between the control panel and its door as much as possible since radio waves are leaked from the space.
Attach some EMI gaskets to fill up the space and suppress the leakage of radio waves.

(2) Q4AR system

In the Q4AR system, take the following measures in addition to (1) mentioned above.

(a) To ensure the electric contact between the control panel and its door, remove the coating of the contact areas, attach EMI gaskets and conducting adhesive tapes and connect the panel and the doors with thick wires. (See Fig. 1.)

(b) Ensure electric contact between the PLC and inner plate inside the control panel by galvanizing the inner plate, as an example. (Plating thickness: 10μm or more) (See Fig. 1.)



*1 Do not apply coating to the parts where EMI gaskets and conducting adhesive tapes are to be attached.
*2 These wires are used to strengthen conductivity between the doors and control panel.

Fig.1. Example of Control Panel Inside

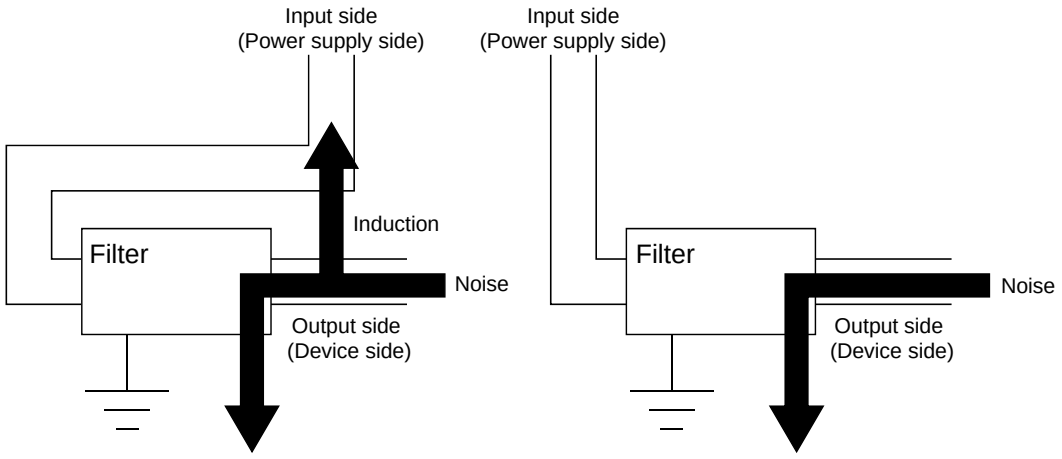
2. Cable

As a cable coming out from the control panel will release noise by functioning like an antenna, make sure to use a shield cable. (See [1] in Fig. 2.)

3. Noise filter

Make sure to attach a noise filter to the power cable. (See [2] in Fig.2.)
It is recommended to use the DENSEI-LAMBDA MB series.

(1) Do not install the input and output cables of the noise filter together to prevent the input noise inducting into the output cable.



(a) Installing the input and output cables together will cause noise induction.

(b) Separate the input cable from the output cable.

(2) Connect the noise filter's ground terminal to the control panel with the shortest cable as possible (approx. 10cm (3.94 in.) or less).

4. Line filter

Be sure to attach a line filter to the AC power cable.
Attach the line filter to the power cable inside the control panel at the position closest to the cable hole. (See [3] in Fig. 2.)
It is recommended to use the Mitsubishi FR-BLF line filter.

5. Ferrite core

Ferrite cores should be attached to all of the cables (including power cables) coming out from the control panel.

(1) Power cable

Twist the power cables (including grounding wires).
Attach a ferrite core to the twisted power cables at the position closest to the power supply module as possible. (See [4] in Fig.2.)
If attached at an improper position, the ferrite core will not function effectively.
It is recommended to use Tokin's ESD-SR-25.

(2) Signal cable

Attach a ferrite core to the signal cable (shield cable) inside the control panel at the position closest to the cable hole. (See [5] in Fig.2.)
If attached at an improper position, the ferrite core will not function effectively.
It is recommended to use Tokin's ESD-SR-25.

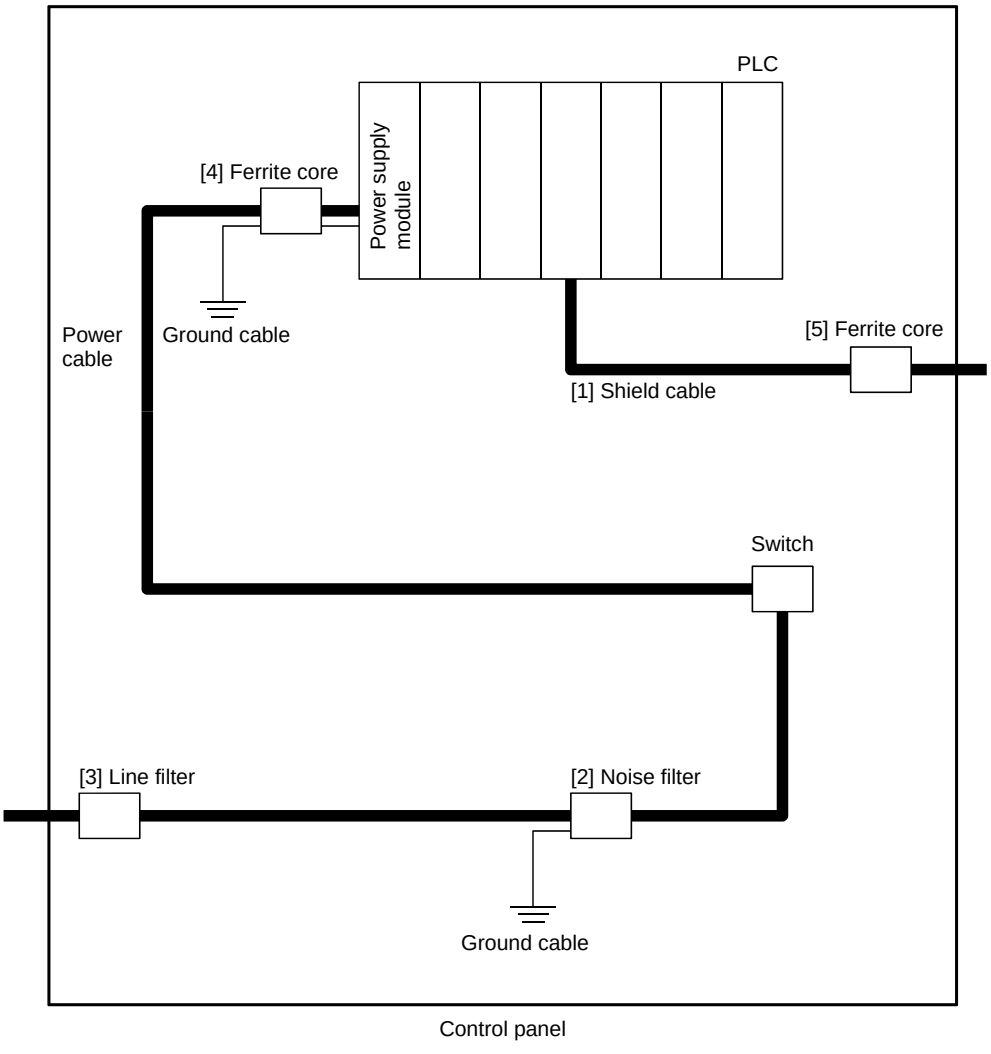


Fig. 2. Example of Noise Filter, Line Filter and Ferrite Cores Set inside Control Panel