

# CMP relay - Current monitoring, AC input

## Datasheet



### Description

Current monitoring railway relay with two change-over contacts. Suitable for AC currents (16-60 Hz) and no auxiliary power supply necessary. The pull-in current is adjustable with a lockable knob. The contacts are weld-no-transfer contacts: they are mechanically forced in the same position.

The construction of the relay and choice of materials makes the CMP relay suitable to withstand corrosive atmospheres, low and high temperatures, shock & vibrating and dry to very humid environments.

No external socket necessary, the relay can be mounted directly on a 35 mm rail without extra fasteners, or on any surface via 2 screws.

### Application

These relay series are designed for rolling stock applications. The CMP is used in applications for accurate current monitoring.

### Features

- Current monitoring relay
- AC input (16-60 Hz)
- 2 C/O contacts
- Very sensitive, very accurate
- Adjustable pull-in current via lockable knob
- Total current range: 0.2-12 A
- Weld-no-transfer contacts
- No auxiliary power supply necessary
- Screw terminals IP20
- Mounting on 35 mm rail
- Mounting on any surface via 2 screws

### Benefits

- Proven reliable
- Long term availability
- Easy to maintain
- Low life cycle cost
- No maintenance

### Railway compliancy

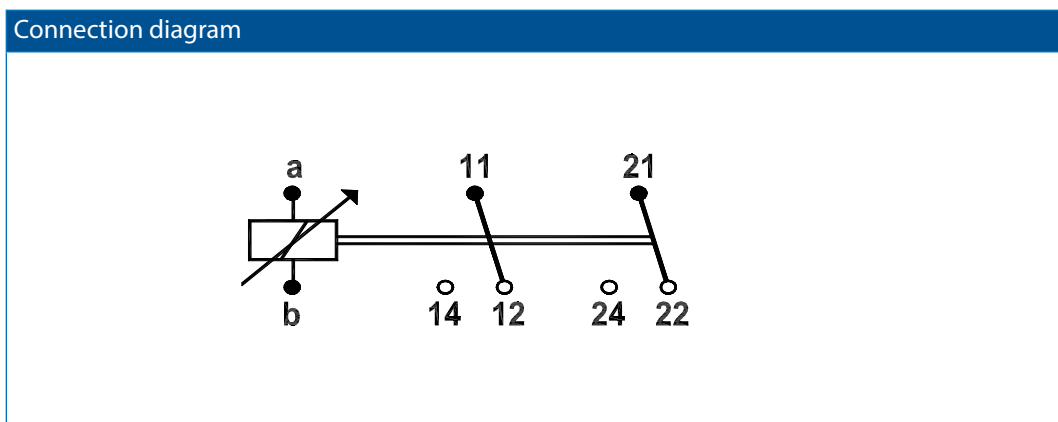
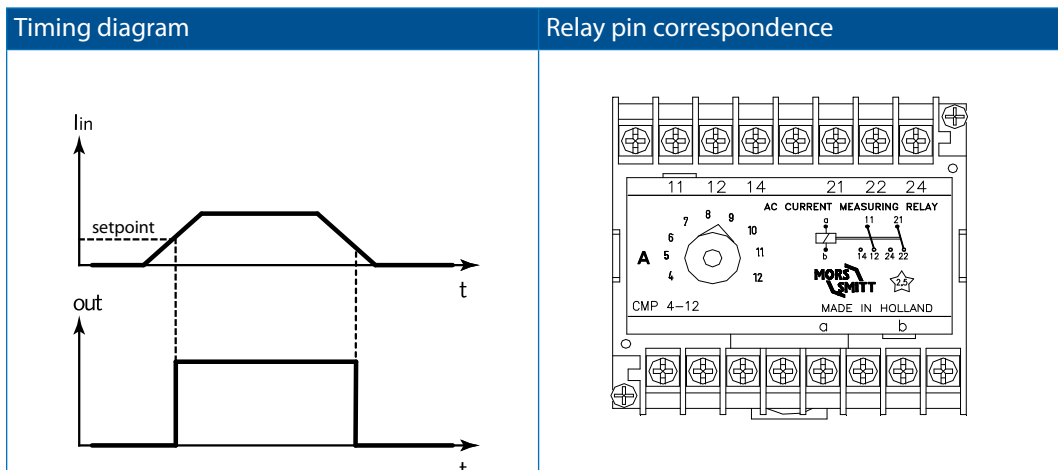
- EN 50155 Electronic equipment used on rolling stock for railway applications
- IEC 60571 Electronic equipment used on railway vehicles
- IEC 60077 Electrical equipment for rolling stock in railway applications
- IEC 60947 Low voltage switch gear and control gear
- IEC 61373 Rolling stock equipment - Shock and vibration test
- EN 50121 Electromagnetic compatibility for railway applications
- NF F 16-101/102, TS 45545-2 Fire behaviour - Railway rolling stock
- IEC 60529 European standard describes the protection class (IP-code)
- NF F 62-002 On-off contact relays and fixed connections

# CMP relay

## Technical specifications



### Functional and connection diagrams



# CMP relay

## Technical specifications

### Time delay

Accuracy - adjustment	≤ 5 % After adjusting no variation in setpoint
Accuracy - repeatability	≤ 2 %
Current variation vs. temperature variation	≤ 0.02 % / K
Current variation vs. frequency variation	at I <sub>max</sub> : ≤ 0.1% / Hz at I <sub>min</sub> : ≤ 0.05% / Hz
Hysteresis	5 %
Trip time	See graph
Release time	See graph

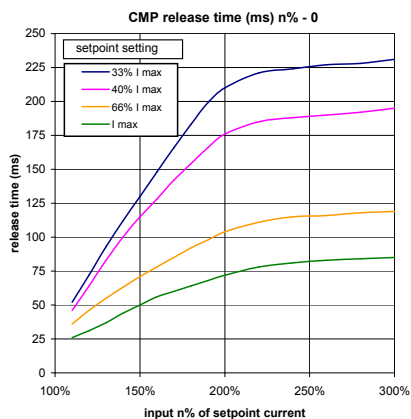
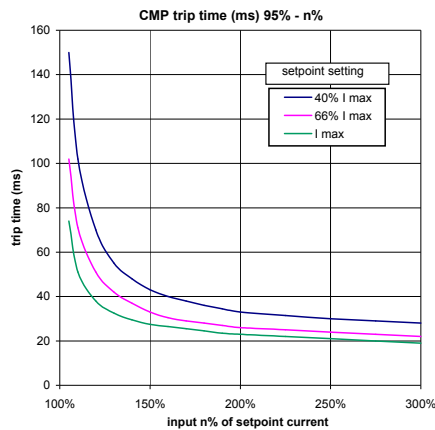
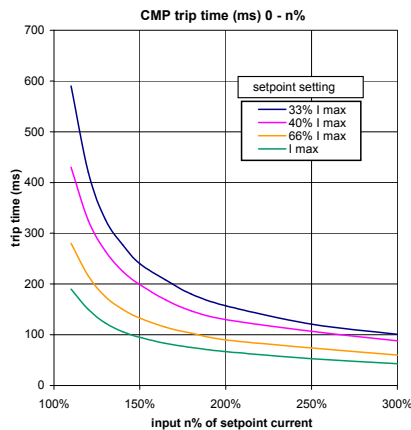
#### Example pull-in current setting:

CMP 2-G: setpoint set on 5 A. The pull-in current will be between 4.75 A - 5.25 A.

For example: 5.0 A. The ambient temperature is 40 degrees Celsius which is 20 degrees different compared to the standard 20 degrees Celsius. This results in 0.4 % extra current variation.

The frequency is 50 Hz which is 34 Hz different compared to the standard 16 Hz. this results in maximum 3.4 % extra current variation. The total current variation is then 2.0 % (repeatability) + 0.4 % (temperature variation) + 3.4 % (frequency variation) = 5.8 %.

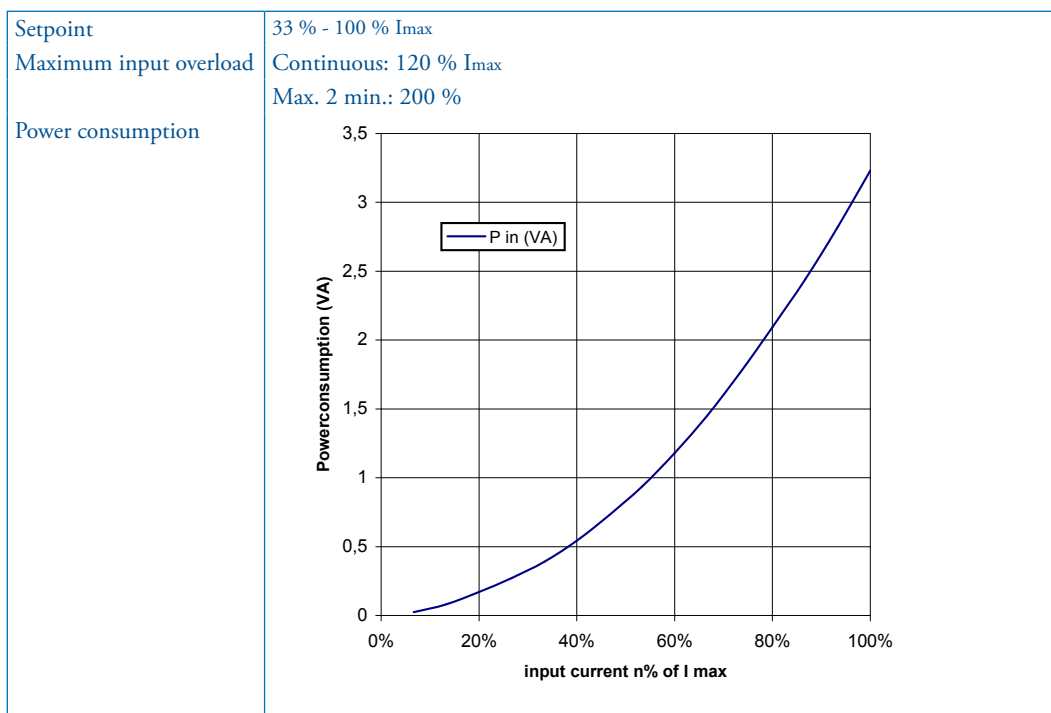
In this case the pull-in current will be between 4.71 A and 5.29 A.



# CMP relay

## Technical specifications

### Coil characteristics



Type	$I_{nom}$ (AAC)	Frequency (Hz)	$I_{max}$ (AAC)
CMP 0.2 - 0.6	0.2-0.6	16-60	0.6
CMP 0.5-1.5	0.5-1.5	16-60	1.5
CMP 1-3	1-3	16-60	3
CMP 2-6	2-6	16-60	6
CMP 4-12	4-12	16-60	12

Other types on request.

# CMP relay

## Technical specifications

### Contact characteristics

Amount and type of contacts	2 C/O
Maximum make current	15 A
Maximum continuous current	6 A (AC1 ; IEC 60947)
Maximum switching voltage	300 VDC (then maximum current = 300 mA) 250 VAC (then maximum current = 2.6 A)
Minimum switching voltage	12 V
Minimum switching current	10 mA
Maximum switching capacity	See graph on page ..
Contact resistance	15 mΩ (initial)
Material	Ag + 0.2 μm Au
Contact gap	0.3 mm
Contact force	> 200 mN

Note: contacts cannot have a different position (Weld-no-transfer)

### Electrical characteristics

Dielectric strength	Pole-pole	EN 50155	
	Cont-coil	IEC 60255-5	3.5 kV, 50 Hz, 1 min
Insulation between open contacts		IEC 60077	4 kV, 50 Hz, 1 min
Pulse withstanding		IEC 60255-5	2.5 kV (1.2/50 μs)

### Mechanical characteristics

Mechanical life	10 x 10 <sup>6</sup> operations
Maximum switching frequency	Mechanical: 3600 ops/h Electrical: 1200 ops/h
Weight	450 g (without options)
Terminal screws	M3.5 x 8 mm

### Environmental characteristics

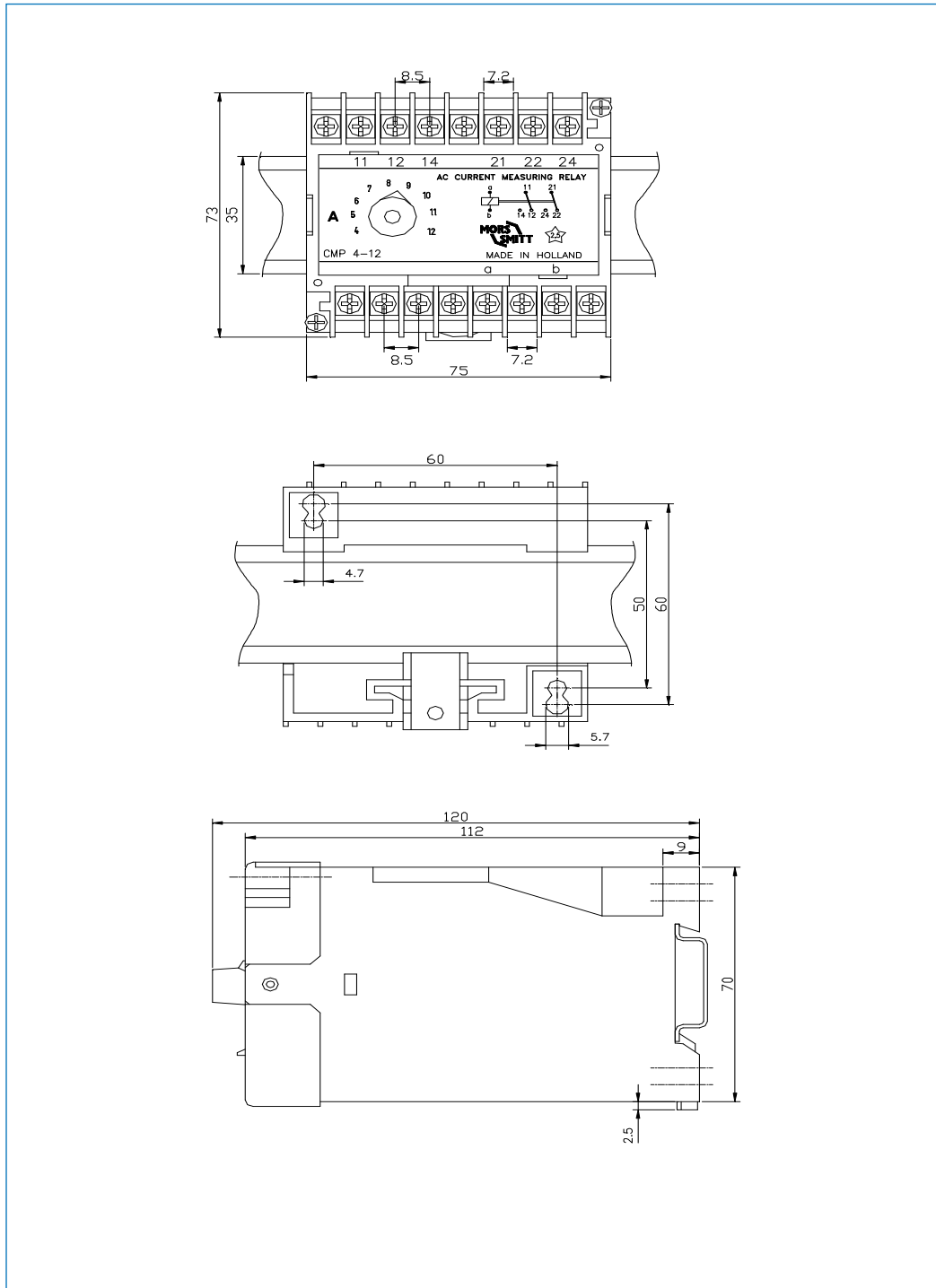
Environmental	EN 50125-1 and IEC 60077-1
Vibration	IEC 61373, Category I, Class B, Body mounted
Shock	IEC 61373, Category I, Class B, Body mounted
Operating temperature	-40 °C...+70 °C
Humidity	90% (condensation is permitted temporarily)
Salt mist	IEC 60068-2-11, Class ST 4
Damp heat	IEC 60068-2-30, Test method Db variant 1
Protection	IEC 60529, IP20



# CMP relay

## Technical specifications

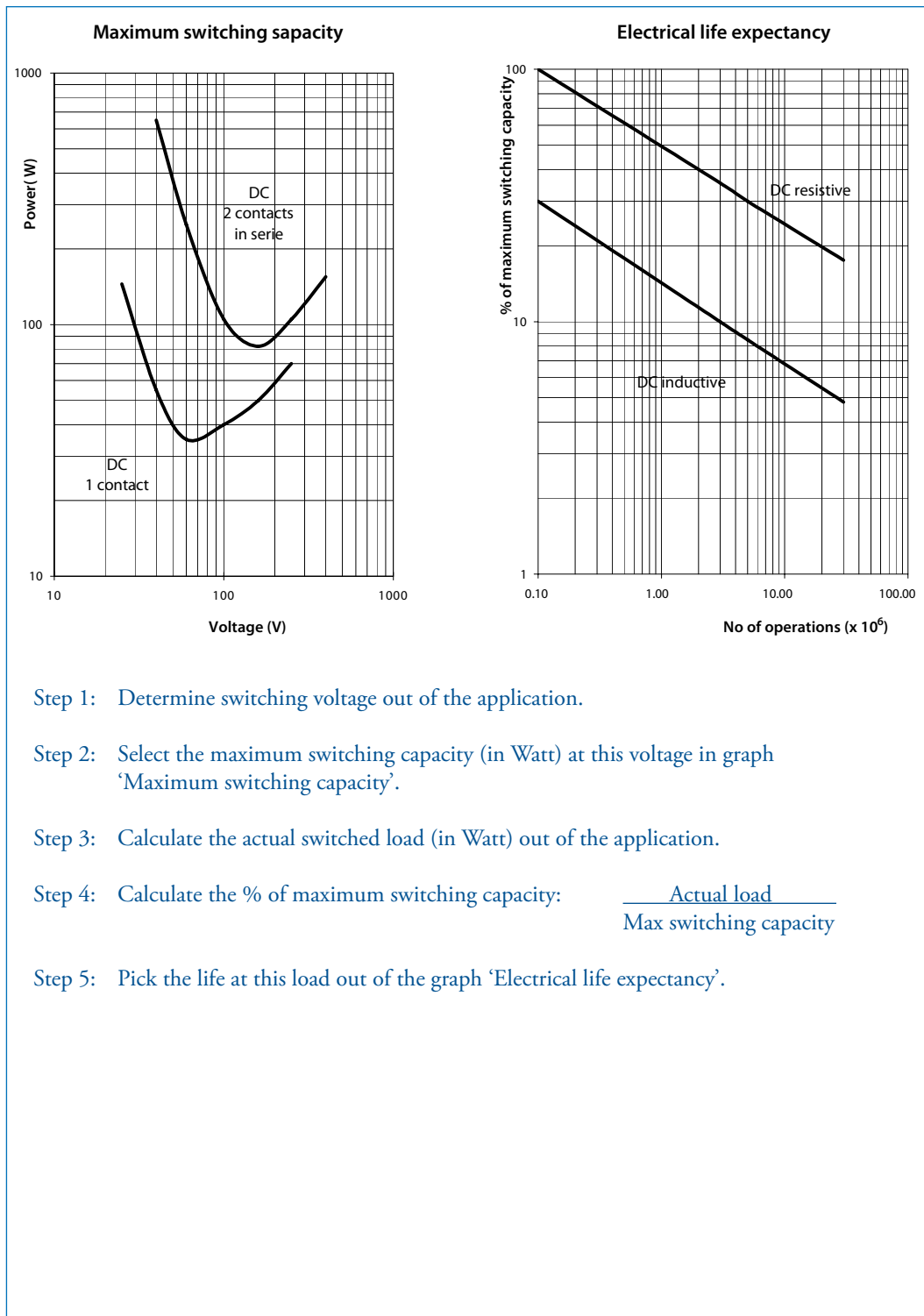
### Dimensions (mm)



# CMP relay

## Technical specifications

### Switching capacity and contact life



# CMP relay Instructions

## Installation, operation & inspection

### Installation

Before installation or working on the relay: disconnect the power supply first! Install relay and connect wiring according to the terminal identification. Relays can be mounted tightly together to save space.

When rail mounting is used, always mount the relay with the text on the label readable (not upside down) to have proper fixation of the relay on the rail.

#### **Warning!**

- Never use silicon in the proximity of the relays.
- Do not use the relay in the presence of flammable gas as the arc generated from switching could cause ignition.

### Operation

After installation always apply the rated current to the coil to check correct operation.

Before actual use of relays, it is advised to switch the load several times with the contacts. The contacts will both be electrically and mechanically cleaned due to the positive wiping action. Sometimes a contact can build up increased contact resistance ( $\leq 15 \text{ m}\Omega$  when new). When using silver contacts one can clean the contact by switching a contact load a few times using  $>24 \text{ VDC}$  &  $\sim 2 \text{ A}$ . Increased contact resistance is not always problematic, as it depends on circuit conditions. In general a contact resistance of  $1 \Omega$  is no problem, consult Mors Smitt for more information.

Condensation in the relay is possible when the coil is energised (warm) and the outside, environmental temperature is cold. This is a normal phenomenon and will not affect the function of the relay. Materials in the relay have no hygroscopic properties.

### Inspection

If the relay does not seem to operate correctly, check for presence of the appropriate coil current using a suitable multimeter. If a LED is fitted, it indicates voltage presence to the coil.

If the relay doesn't work after inspection, replace the relay unit with a similar model. Do not attempt to open the relay cover or try to repair. Contacts are calibrated and in balance, touching can affect proper operation. Also resoldering may affect correct operation.

Most relay defects are caused by installation faults such as overvoltage, spikes/transients, high/short current far exceeding the relay specifications. When returning the relays for investigation, please provide all information on the RMA form. Send defective relays back to the manufacturer for repair or replacement. Normal wear and tear or external causes are excluded from warranty.





# CMP relay

## Ordering scheme

Configuration:

<b>CMP</b>	<b>1-3</b>
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1. Relay model      2. Coil current

This example represents a **CMP 1-3**

**Description:** CMP series relay,  $I_{nom}$ : 1-3 AAC 16-60 Hz

1. Relay model

<b>CMP</b>
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2. Coil current

<b>0.2 - 0.6 AAC, 16-60 Hz</b>
<b>0.5 - 1.5 AAC, 16-60 Hz</b>
<b>1 - 3 AAC, 16-60 Hz</b>
<b>2 - 6 AAC, 16-60 Hz</b>
<b>4 - 12 AAC, 16-60 Hz</b>





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