



Guidelines on the Declaration of Conformity

A conformity evaluation has been carried out for the product in terms of the EU Low Voltage Directive 2014/35/EU and the Electromagnetic Compatibility (EMC) Directive 2014/30/EU. The Declaration of Conformity is laid out in writing in a separate document and can be requested if required.

Guidelines on the EMC Directive (2014/30/EU)

The product cannot be operated independently according to the EMC directive. Only after integration of the product into an overall system can this be evaluated in terms of the EMC. For electronic equipment, the evaluation has been verified for the individual product in laboratory conditions, but not in the overall system.

Guidelines on the Machinery Directive (2006/42/EC)

The product is a component for installation into machines according to the machinery directive 2006/42/EC. The product can fulfil the specifications for safety-related applications in coordination with other elements. The type and scope of the required measures result from the machine risk analysis. The product then becomes a machine component and the machine manufacturer assesses the conformity of the safety device to the directive. It is forbidden to start use of the product until you have ensured that the machine accords with the regulations stated in the directive.

Guidelines on the ATEX Directive

Without a conformity evaluation, this product is not suitable for use in areas where there is a high danger of explosion. For application of this product in areas where there is a high danger of explosion, it must be classified and marked according to directive 2014/34/EU.

Safety and Guideline Signs

DANGER



Immediate and impending danger, which can lead to severe physical injuries or to death.

CAUTION



Danger of injury to personnel and damage to machines.



Guidelines on important points.

General Safety Guidelines

DANGER



Danger of death! Do not touch voltage-carrying lines and components.

DANGER



Danger of burns when touching hot surfaces

CAUTION



- Danger from devices caused by short-circuits and earth short-circuits at the terminals
- Electronic devices cannot be guaranteed fail-safe.

During the risk assessment required when designing the machine or system, the dangers involved must be evaluated and removed by taking appropriate protective measures.

To prevent injury or damage, only professionals and specialists are allowed to work on the devices. They must be familiar with the dimensioning, transport, installation, initial operation, maintenance and disposal according to the relevant standards and regulations.

General Safety Guidelines



Only carry out installation, maintenance and repairs in a de-energised, disengaged state and secure the system against inadvertent switch-on.



Before product installation and initial operation, please read the Installation and Operational Instructions carefully and observe the Safety Regulations. Incorrect operation can cause injury or damage.

Installation and Operating Instructions for Phase Demodulator Type 012.00_2

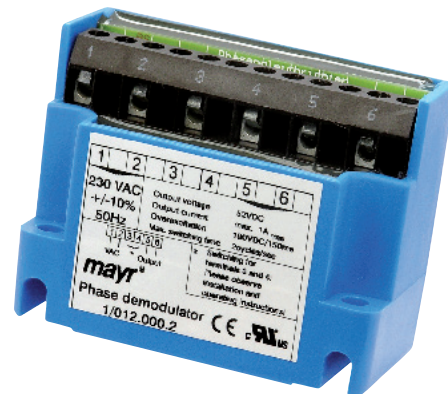
(B.01200+2.EN)

Application

Phase demodulators are used to connect DC units to alternating voltage supplies. Due to automatic switching from the applied overexcitation voltage to the holding voltage, it is possible to energise brakes for shorter switching times with overexcitation and to reduce power dissipation after the armature disk has attracted.



Phase demodulators are not suitable for all applications, e.g. use of the phase demodulator when operating noise-damped brakes is not possible. The product's suitability should be checked before use.



Function

The phase demodulator is used for an input voltage of 230 VAC or 400 VAC.

The coil is energised after the input voltage is switched on using overexcitation voltage. After the overexcitation time, the unit switches automatically to the holding voltage.

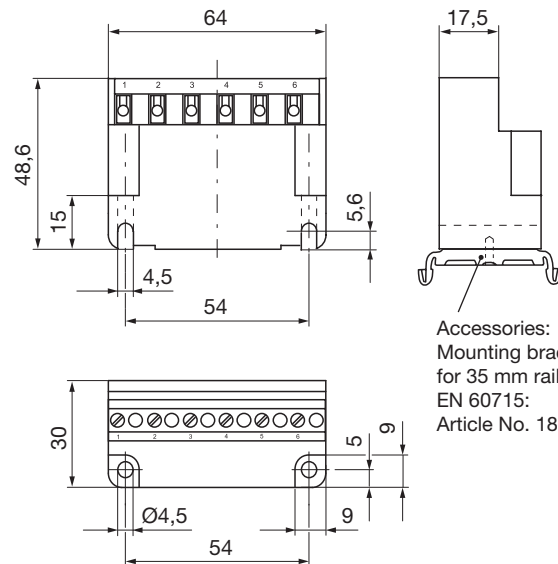
Apart from this, the phase demodulator has an integrated automatic DC-side disconnection. In contrast to the usual DC-side disconnection, no further protective measures or external components are required. The DC-side disconnection is activated as a standard measure (terminals 3 and 4 are not wired) and causes short switching times on the electromagnetic consumer.

The integrated automatic DC-side disconnection can be deactivated by fitting a bridge between the terminals 3 and 4. The coil is de-energised via an internal freewheeling diode. This has the advantages of soft brakings and quieter switching noises. However, this substantially lengthens the switching times (approx. 6 – 10x).

Electrical Connection (Terminals)

- 1 + 2 Input voltage
- 3 + 4 Deactivation of integrated automatic DC-side disconnection
- 5 + 6 Output voltage

Dimensions (mm)



Accessories:
Mounting bracket set
for 35 mm rail acc.
EN 60715:
Article No. 1802911

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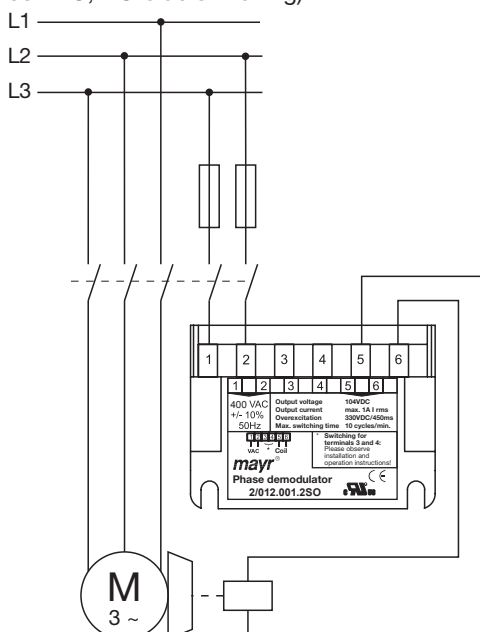
Technical Data				Size					
				1				2	
Type				012.000.2	012.001.2 SO	012.002.2 SO	012.003.2 SO	012.005.2 SO	012.001.2 SO
Input voltage	± 10%	U_i	[VAC]	230 50 Hz	230 50 Hz	230 50 Hz	230 50 Hz	230 50 Hz 60 Hz	400 50 Hz
	Holding voltage		± 35%	U_{hold}	[VDC]	52	52	52	90
Output voltage	Overexcitation voltage	± 35%	U_{over}		[VDC]	190	190	190	190
	Overexcitation time	± 20%		t_{over}	[ms]	150 plus ±10	450 plus ±10	700 plus ±10	30 plus ±10
Output current at	≤ 45 °C	I_{RMS}	[A]		1	1	1	1	1
Max. coil power			P	[W]	130	130	130	130	130
Max. switching frequency			[1/min]	120	10	10	120	10	10
Device fuses				FF 5 A (H) 5 x 20 mm					FF 4 A (H) 6.3x32 mm
Protection				IP65 components				IP20 terminals	
Terminals				Nominal cross-section 1.5 mm ² (AWG 22-14), screws M3, max. tightening torque 0.5 Nm					
Ambient temperature			[°C]	-25 to +85					
Storage temperature			[°C]	-40 to +85					
Conformity markings									
Installation conditions				The installation position can be user-defined. Please ensure sufficient heat dissipation and air convection! Do not install near to sources of intense heat!					



Special designs with other input and output voltages as well as longer overexcitation times are available on request!

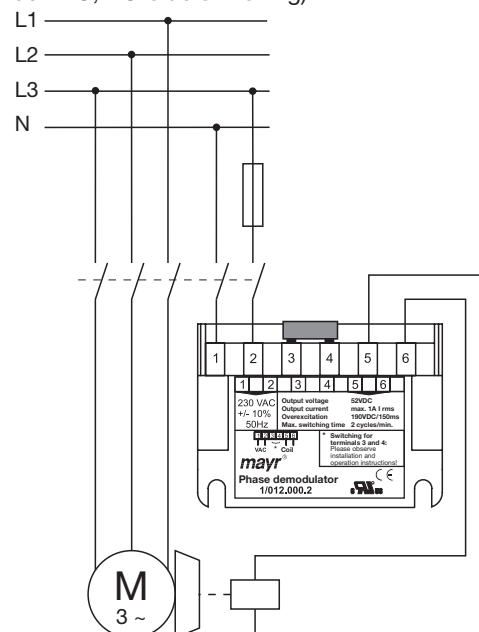
Wiring Example

(400 VAC, DC-side switching)



Wiring Example

(230 VAC, AC-side switching)



Switch-ON

Switch-on always takes place AC-side, as only then is the overexcitation activated.

Switch-OFF



If short switching times are required, please switch DC-side.

If a longer brake engagement time or a quieter switching noise is required, please switch AC-side. For this, a bridge must be installed between terminals 3 and 4.

Device Fuses

To protect against damage from short-circuits or earth short-circuits, please add suitable device fuses to the mains cable.

Short-circuits or earth short-circuits can lead to phase demodulator failures. After fuse elements have reacted to a malfunction, the phase demodulator must be checked for functional and operational safety (overexcitation voltage, switch-off voltage, response delay time, holding voltage). The same procedure is to be carried out after coil failure.

Overexcitation time t_{over}



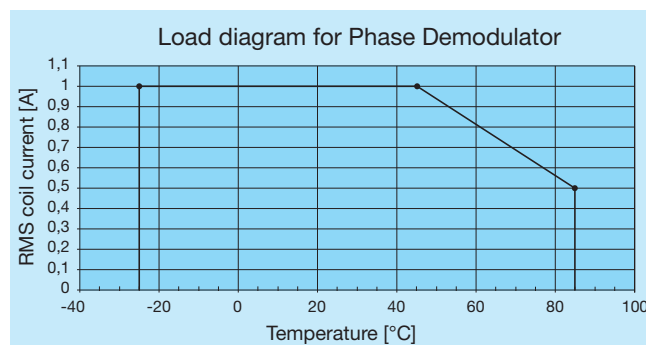
Increased wear (enlarged air gap) as well as coil heat-up lengthen the brake separation time t_2 . Therefore, when dimensioning the overexcitation time t_{over} , please select at least double the separation time t_2 on each brake Type and size (catalogue values).

Recovery Time 50 ms

The recovery time is the time the phase demodulator requires in order to reach its starting position after switch-off. Therefore, the input voltage may be switched on again at the earliest after 50 ms.

During cycle operation, please take suitable measures to ensure that the recovery time of 50 ms is kept to.

Maximum Output Current



Coil Capacity



$$P_{RMS} \leq P_{nom}$$

The coil capacity P_{RMS} must not be larger than P_{nom} or the nominal current I_{RMS} which flows through the phase demodulator must not be exceeded, as otherwise the coil and the phase demodulator can fail due to thermic overload.

Calculations:

P_{RMS} [W] RMS coil capacity dependent on switching frequency, overexcitation, reduction in capacity and duty cycle

$$P_{RMS} = \frac{P_{over} \times t_{over} + P_{hold} \times t_{hold}}{t_{tot}}$$

P_{nom} [W] Coil nominal capacity (catalogue values, Type tag)

P_{over} [W] Coil capacity on overexcitation

$$P_{over} = \left(\frac{U_{over}}{U_{nom}} \right)^2 \times P_{nom}$$

P_{hold} [W] Coil capacity at reduced capacity

$$P_{hold} = \left(\frac{U_{hold}}{U_{nom}} \right)^2 \times P_{nom}$$

t_{over} [s] Overexcitation time

t_{hold} [s] Time of operation with reduction in capacity

t_{off} [s] Time without voltage

t_{tot} [s] Total time ($t_{over} + t_{hold} + t_{off}$)

U_{over} [V] Overexcitation voltage

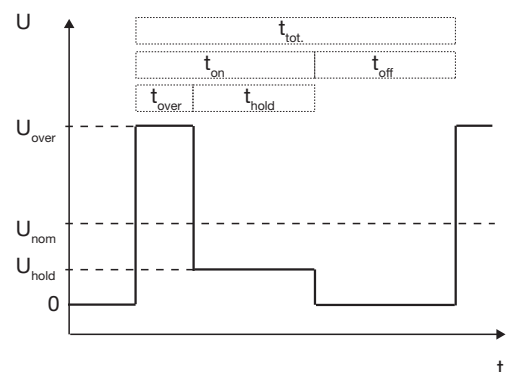
U_{hold} [V] Holding voltage

U_{nom} [V] Coil nominal voltage

I_{eff} [A] RMS current, dependent on switching frequency, overexcitation time and duty cycle

$$I_{RMS} = \sqrt{\frac{P_{RMS} \times P_{nom}}{U_{nom}^2}}$$

Time Diagram:

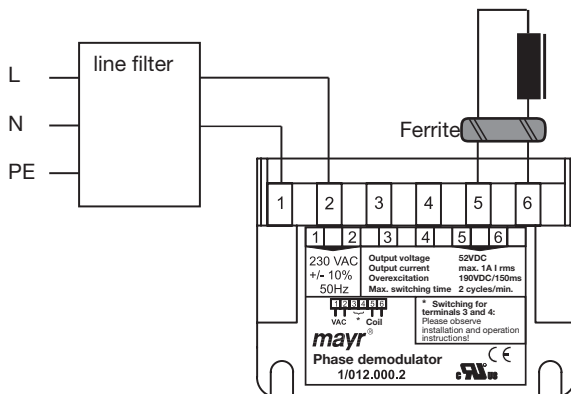


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EMC-compatible Installation

The measure described for compliance with the EMC directive is examined under laboratory conditions. It can not be transferred obligatorily to the condition of a machine or equipment due to deviations. The inspection tests the individual components *mayr*[®]-phase demodulator and the *mayr*[®]-brake and is applicable for an input voltage of 230 VAC.



Measure

Installation of a line filter in the AC-supply line (e. g. Epcos B84112-B-B30)

Installation of a snap ferrite (e. g. Würth 74271221) or of a ferrite sleeve (e. g. Würth 74270090) with a three line cable feedthrough in the brake cable

Please mount the line filter, snap ferrite or ferrite sleeve directly onto the phase demodulator!



- Avoid an antennae effect:
Keep the supply cables as short as possible;
do not form rings or loops with the cables!
- Mount good earth connections onto the metal body of the brake!
- Lay control cables separately from power cables or from strongly pulsating supply cables!
- During operation with a frequency converter, please ensure EMC-compatible installation of the frequency converter!
- Please always check the holding voltage of the phase demodulator during operation of all components in the system!

Standards

Product standard

VDE 0160/DIN EN 50178:1998-04

Electronic equipment for use in power installations

EMC inspections

EN 61000-6-2:2006-03

Interference immunity

EN 61000-6-4:2007-09

Interference emission

Insulation coordination

acc. VDE 0110 / EN 60664:2008-01

Overvoltage category III

Pollution degree 1

Rated insulation voltage 400 V_{RMS}

Intended Use

mayr[®]-rectifiers have been developed, manufactured and tested as electronic equipment in compliance with the DIN EN 50178 standard and in accordance with the EU Low Voltage Directive. During installation, operation and maintenance of the product, the requirements for the standard must be observed. *mayr*[®]-rectifiers are for use in machines, systems and devices and must only be used in the situations for which they are ordered and confirmed. The products are designed for installation into electrical control cabinets and terminal boxes. Using them for any other purpose is not allowed.