

# INFANOR

## *OPERATING MANUAL*

### *SERIES SMTBM*

### *BRUSHLESS SINGLE AXIS MODULE*

**Version 4.0**



This is a general manual describing a series of single axis module Servo Amplifiers having output capability suitable for driving Brushless Servo Motors. This manual may be used in conjunction with appropriate and referenced drawings pertaining to the various specific models. Maintenance procedures should be attempted only by highly skilled technicians (EN 60204.1) using proper test equipment. Read your warranty provision carefully before attempting to adjust or service the unit.

## **RECEIVING AND HANDLING**

Upon delivery of the equipment, inspect the shipping containers and contents for indications of damages incurred in transit. If any of the items specified in the bill of lading are damaged, or the quantity is incorrect, do not accept them until the freight or express agent makes an appropriate notation on your freight bill or express receipt.

Claims for loss or damage in shipment must not be deducted from your invoice, nor should payment be withheld pending adjustment of any such claims.

Store the equipment in a clean, dry area. It is advisable to leave the equipment in its shipping container until ready for use. Each amplifier is checked carefully before shipment. However, upon receipt, the user should make sure that the amplifier received corresponds to or is properly rated in terms of rated voltage and current for the type of motor which is to be driven. The descriptive label affixed to the amplifier specifies electrical ratings.

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INFRANOR  
SERIES SMTBM  
BRUSHLESS SINGLE AXIS MODULE  
(April 1998)**

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## 1.0.0 GENERAL

### 1.1.0 Introduction

The SMTBM single axis module is designed for the SMTBSI and SMTBD Series amplifier fitted with the braking regulator option ("d" or "dp") integrated in the amplifier. Maximum current capabilities is 20 Arms with 60 Arms peak (5% duty cycle).

### 1.2.0 Special features

- Back Panel mounting
- Fan and heatsink cooling
- Standard shunt regulator depending on amplifier output (100-280W)
- Easy amplifier plug-in connections
- Three or single phase autotransformer
- Can operate with auto-transformer
- Direct line input connection (with line filter)

## 2.0.0 SPECIFICATIONS

### 2.1.0 Technical specifications for SMTBM Module

The SMTBM Module is designed for the SMTBSI or SMTBD Brushless amplifier fitted with the optional shunt regulator ("dp") mounted in the amplifier. The module incorporates a DC bus power supply capable of driving a motor with an output of 20 Arms continuous and 60 Arms peak maximum (5% duty cycle).

A three phase isolation transformer or an auto-transformer is required to power the unit. Direct connection to the main 220 VAC line is possible (10Arms or less) when using the appropriate line filter.

The shunt resistor needs to be mounted outside the unit in an area protected against any physical contact and if possible near a cooling fan.

The single-axis rack housing **MUST BE GROUNDED** in order to ensure physical protection in case of insulation failures to the mains. INFRANOR will withdraw any warranty on all material which does not meet this requirement.

Rated input voltage	3Ø 220VAC +10% -15%
Rated auxiliary input voltage	1Ø 220VAC +10% -15%
Maximum continuous output current	20ARMS
Maximum peak output current	60ARMS (5% duty cycle)

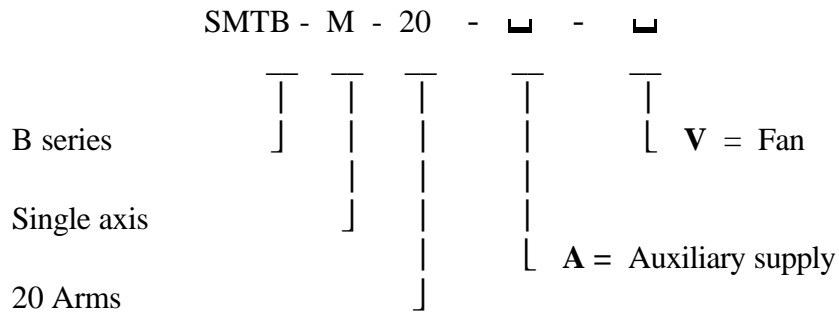
The continuous current capabilities according to the different cooling type are as follows:

AMPLIFIER	IMAX (1 Sec)	CONT. CURRENT (I <sub>rms</sub> ) *		
		NO FAN	FAN	FAN /HEATSINK
220/04	4	2	-	-
220/08	8	4	-	-
220/12	13	6	-	-
220/17	17	8.5	-	-
220/30	29	10.0*	12	15
220/45	46	10.0*	15	20
220/60	58	10.0*	19	20

\*Maximum ambient temperature = +40°C  
Fan = 36 CFM

An auxiliary DC supply is incorporated in the SMTBM Module to maintain the logic voltage separate from the main DC power. See section 3.1.0 for connections

Designation of SMTBM Single Axis Module



Shunt regulator specifications

The shunt resistor size depends on the amplifier current capabilities and is mounted outside the unit.

AMPLIFIER	RESISTOR (ohms)	RATED (W)	PEAK POWER (W)
220/04	100	100	1600
220/08	100	100	1600
220/12	100	100	1600
220/17	100	100	1600
220/30	50	200	3200
220/45	15	280	10000
220/60	15	280	10000

The shunt resistor is delivered with the amplifier and must be connected to the 2 point connection mounted on the side of the amplifier (option "dp"). The resistor is mounted inside a protective housing to avoid electrical shocks (see chapter 4.3.0 for dimensions).

### 2.1.1 Standard compatibility

The **SMTBSI** and **SMTBD** series amplifiers operating in the SMTBM-20A single-axis rack, which is equipped with the mains filter **BF 35**, have been approved for their conformity with the Electromagnetic Compatibility standards:

- EN 55011, Group 1, Class A (conducted and radiated radioelectric disturbances)
- IEC 801 - 2 - 3 - 4 (noise immunity).

Results and test conditions of the LCIE (Laboratories Central des Industries Electriques), which is approved by the European Community, are referenced with n° 416040, 416041, 416042, and 416043.

Results of the tests made according to the Low Voltage directive is referenced in the LCIE report n° 413777.

Standard to be applied to the electrical equipment's of industrial machines: EN 60204.1.

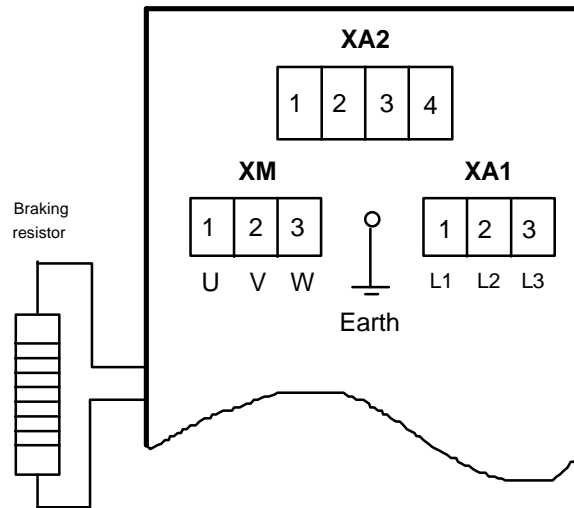
### 2.1.2 "CE" Marking

**CE** recognition marking has been affixed since 1995.

### 3.0.0 CONNECTIONS

#### 3.1.0 SMTBM connections

##### 3.1.1 Upper connector location



##### 3.1.2 XA1 - Power connector

Pin

L1	220 VAC phase 1
L2	220 VAC phase 2
L3	220 VAC phase 3

##### 3.1.3 XM - Motor connector

Pin

U	Motor phase U
V	Motor phase V
W	Motor phase W

**The Earth/Ground log has to be connected to the motor shield and to the system earth ground.** Failure to do so may result in dangerous situation.

##### 3.1.4 XA2- Auxiliary connector

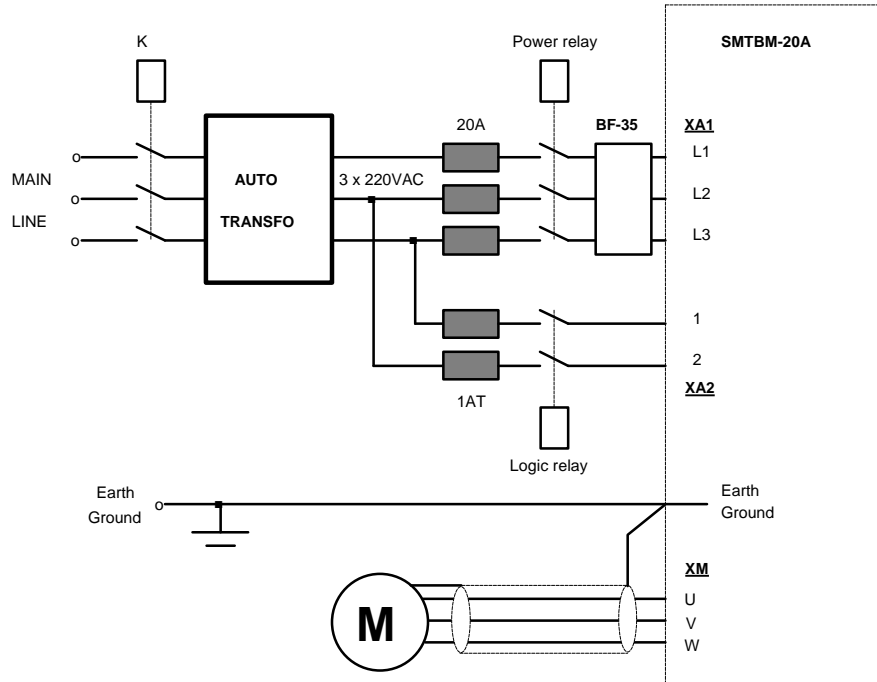
Pin

1	220VAC single phase auxiliary supply
2	220VAC single phase auxiliary supply
3	220VAC for optional fan cooling
4	220VAC for optional fan cooling

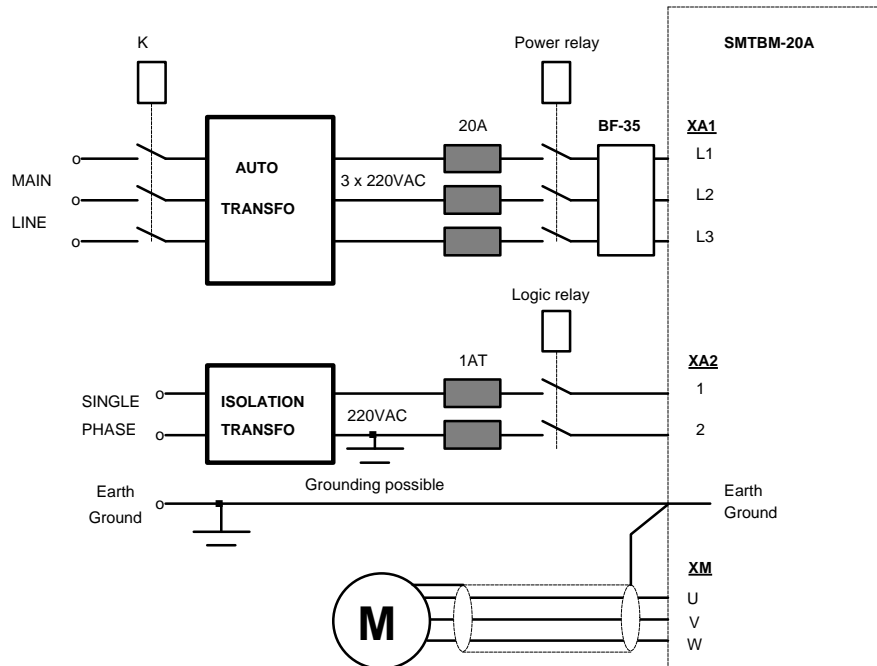
### 3.2.0 SMTBM connections diagram

#### 3.2.1 Auto-transformer connections

Solution 1:



Solution 2:





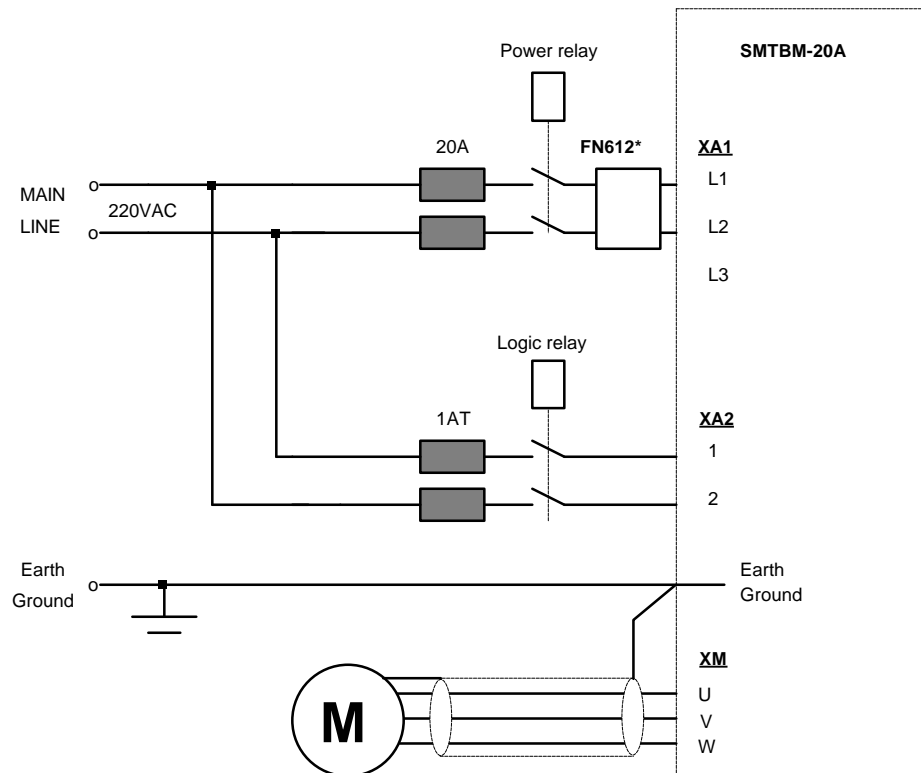
Solution 1: It is mandatory when using an auto-transformer to use the 220VAC for the auxiliary supply at the **output** of the auto-transformer.  
Do not use direct 220VAC from the line.

Solution 2: It is also possible to use a small isolation transformer to power the auxiliary supply.

Caution: The use of an auto-transformer means that there is no isolation between the main line and the amplifier (and consequently to the motor). It is then MANDANTORY to mount fuses or thermal circuit breaker (MOL) in case of a short-circuit.

It is also recommended to use the "AMP READY" logic signal from the amplifier to open the power relay when a default occurs.

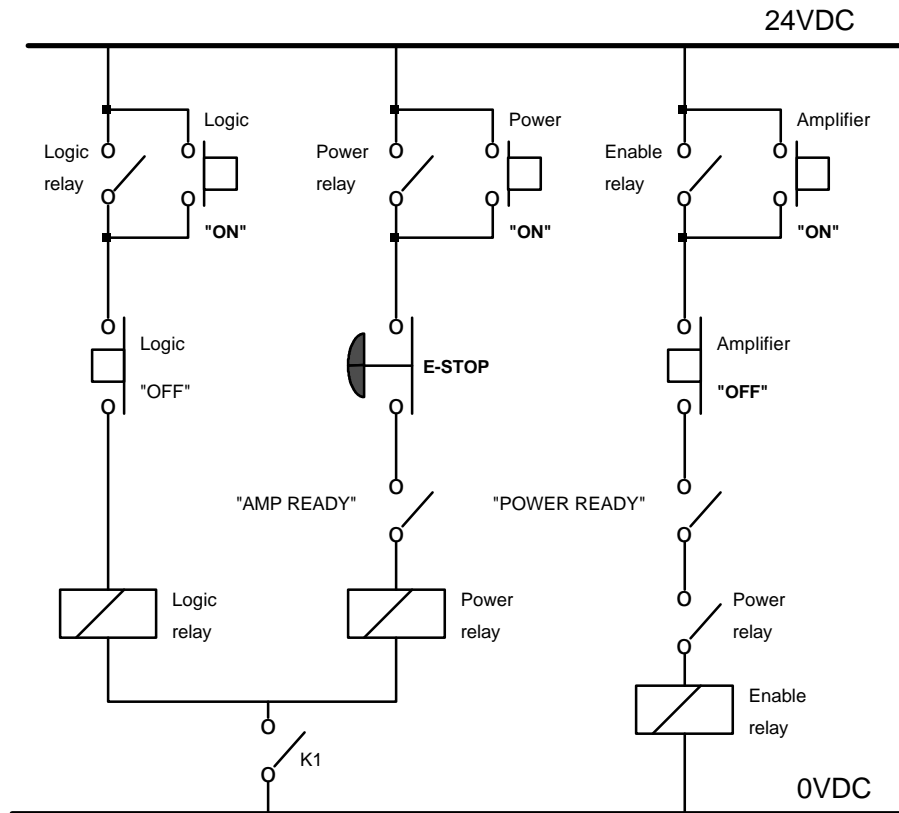
### 3.2.2 Direct line connections



\* Filter type SHAFFNER FN612-20-06

Note: Maximum RMS rated current not to exceed 10ARMS

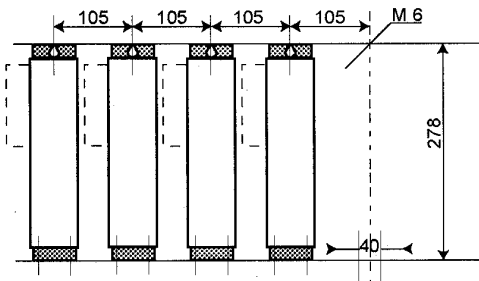
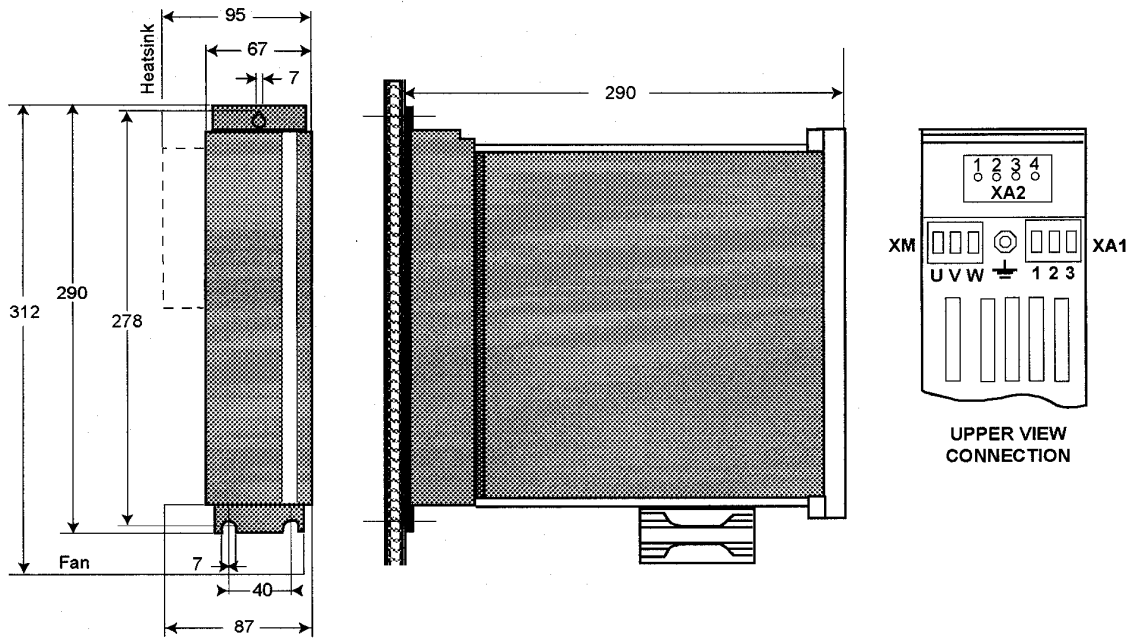
### 3.2.3 Recommended relay connections



Note: This diagram is compatible with the "KL" jumper on the amplifier

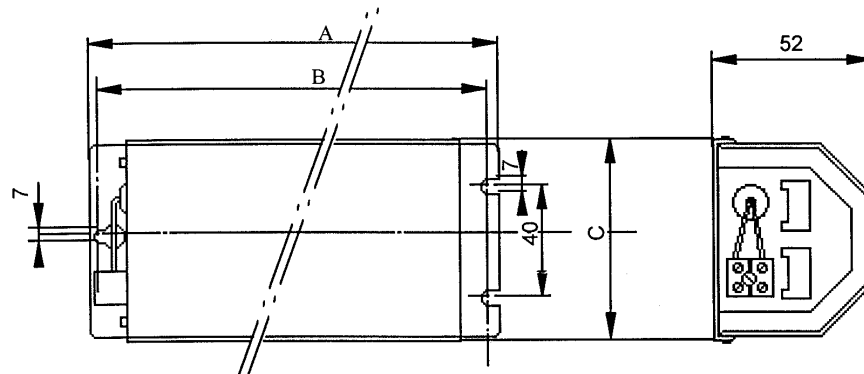
## 4.0.0 DIMENSIONS

### 4.1.0 SMTBM Single axis module



IMPLANTATION

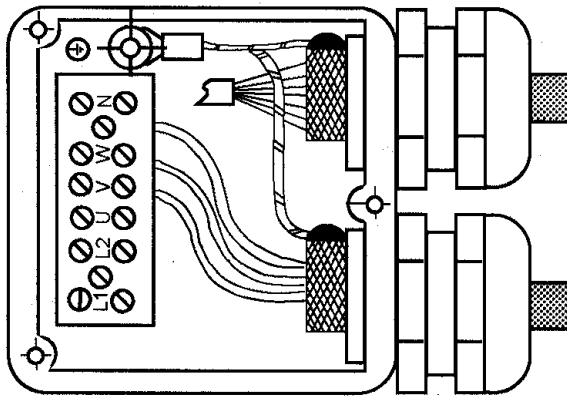
### 4.2.0 Shunt resistor module



Amp	220/04	220/08	220/12	220/17	220/30	220/45	220/60
A	157	157	157	157	157	290	290
B	145	145	145	145	145	278	278
C	83	83	83	83	83	83	83

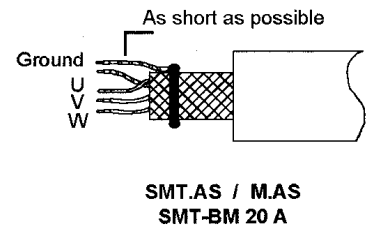
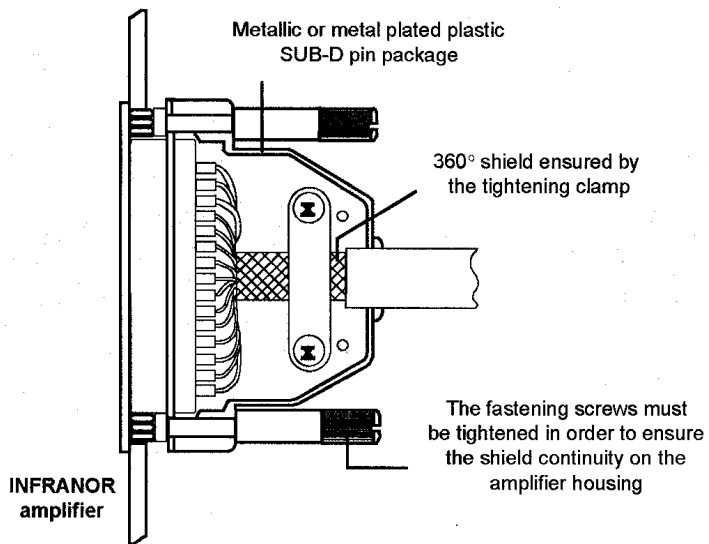
## 5.0.0 SHIELDING RECOMMENDATIONS

There must never be a shield interruption on the whole cable length.



The cable can be soldered on the shield because the connector box is metallic. This solution does not exactly correspond to the EMC requirements but it is acceptable.

Connector box on the MAVILOR motor



Sub-D connector

**Note:** When the 360 degrees shield is made by means of a clamp, it is not necessary to connect a wire to the appropriate pin on the Sub-D connector