

DRM

SLAVE CONTROLLERS FOR FANS WITH VOLTAGE-ADJUSTABLE THREE-PHASE MOTORS

Instruction manual | v. 6.02

PPDRMEN-R06.02-0

Instructions translated from the original

Carefully read every part of this manual. You will find useful information to take full advantage of the product's potential, use it safely and obtain the best results.

RECORD YOUR SYSTEM PARAMETERS!

A space is provided in each parameter table to note set values

SELPRO

Fan Speed Controllers Specialist

Copyright © 2019-2025, SELPRO Srl

All rights reserved in all countries.

Any distribution, alteration, translation or reproduction, partial or total, of this document is strictly prohibited unless with prior authorization in writing from SELPRO Srl with the exception of the following actions:

- Printing the document in its original format, totally or partially.
- Transferring the document on websites or other electronic systems.
- Copying the content without changing it and indicating SELPRO Srl as the copyright owner.

Requests for authorization, additional copies of this manual or technical information on the latter, must be addressed to:

SELPRO Srl
Via Piamarta, 5/11
25021 Bagnolo Mella (BS)
Italy
info@selpro.it
www.selpro.it
+39 (0)30 6821611

Contents

Getting started 4
Support 5

1. Safety information 6
1.1 Safety messages 6
1.2 General warnings 7
1.3 Protections 8

2. Receiving and storage 9
2.1 Handling and storage 9
2.2 Product identification 9

3. Product description 10
3.1 Description 10
3.2 Presentation 11

4. Inputs and outputs 14
4.1 Three-phase power supply and power output for motor(s) 14
4.2 Analog inputs and outputs 15
4.3 Relay output 16

5. Installation 17
5.1 Wall mount 17
5.2 Electrical installation 18

6. Connections 20
6.1 Power supply wiring and power output for motor(s) 20
6.2 Connection to analogue inputs 21
6.3 Auxiliary On/Off inputs connection 23
6.4 OUT analog output connections 23
6.5 Relay output connection 24

7. Operating mode 25
7.1 Slave proportional mode 25

8. Use the controller 28
8.1 Start-up 28
8.2 Default configurations 28
8.3 Set the DIP switch 28
8.4 Modify the cosϕ of the motor 29

9. Diagnostics 30
9.1 Troubleshooting 30

10. Technical specifications 31
10.1 Physical properties 31
10.2 Electrical specifications 33
10.3 Maintenance 34
10.4 Conformity 34

Getting started

Obligations with this instruction manual



This manual is an integral part of the product and must be kept for its entire working life. It must be consulted for all situations related to configuration, use, and maintenance. For this reason, it must always be accessible to the operators.

Instruction manual limits

This manual is intended for the sole device and not for the entire plant! It has been drafted carefully and the consistency between the manual and the product has been verified. Any inconsistencies, errors or omissions must be reported to SELPRO Srl who will integrate them in a new version.

Online manual availability

This instruction manual can be downloaded from the www.selpro.it website. SELPRO Srl reserves the right to keep online information updated to improve use and clarity. In the event of discrepancies between this printed document and the online version, always refer to the latter.

Instruction manual updates

Publication date	Code	Firmware version	Updates
APR 2025	PPDRMEN-R06.02-0	5.4 dated 05/8/2014	Updated "Physical properties" on page 31 Updated "Fix devices with IP55 protection ratings to walls" on page 18 Updated "Connect secondary grounding" on page 18
JAN 2022	PPDRMEN-R06.01-0	5.4 dated 05/8/2014	Updated chapter "Conformity" on page 34 Added image in "Product identification" on page 9
JUN 2021	PPDRMEN-R06.00-0	5.4 dated 05/8/2014	First publication revised in the new format

Models described by the manual

This manual applies to the following models:

DRM 308	DRM 320
DRM 312	DRM 328

Related documents

Document	Code	Date	Format
Instruction manual (this manual)	PPDRMEN-R06.02-0	APR 2025	hard copy
RDM Instruction manual	PPRDMEN-R06.02-0	APR 2025	hard copy
Instructions for programming display installation	PPDisplayEN-R01.00-0	MAY 2020	hard copy

Style conventions

Following are a few style conventions used in this manual:

Path to reach the starting point of the procedure described or to enable the necessary settings to activate the described function. The ">" symbol separates the steps in the path.

Unit of measure

From version 8.0 of the DRM firmware, the temperature and pressure values can be viewed with Imperial units of measure (°F e psi). Therefore, where the text indicates the unit of measure available in °C, it is also available in °F, and where bar is indicated, psi is also available. For the conversion values, use the following formulas:

- temperature: °F = 32+ (°C x 9/5)
- pressure: psi = bar x 14.5

Support

Ask for support

In case of malfunction or fault and requests for assistance, contact SELPRO Srl or the distributor in your country.

How to return the product

If necessary, **ship the product at your own expense and in its original packaging** to the local distributor or directly to SELPRO Srl.

Zone distributor	Customer support service	
Note distributor information here:	SELPRO Srl Via Piamarta, 5/11 25021 Bagnolo Mella (BS) Italy	info@selpro.it www.selpro.it +39 (0)30 6821611

Warranty

To know the warranty terms, exclusions, warranty forfeiture, and how to apply the warranty, please refer to the enclosed sheet.

1. Safety information

1.1 SAFETY MESSAGES

Below are the warnings regarding user safety and the damage to the device provided in this document:

DANGER indicates a dangerous situation which, if not avoided, will cause death or serious injury.

WARNING indicates a dangerous situation which, if not avoided, may cause death or serious injury.

CAUTION indicates a dangerous situation which, if not avoided, may cause slight injury.

NOTICE *indicates obligations that if not met, may cause device damages.*

1.1.1 Qualified staff

This device should only be installed, started and used by qualified technical personnel who are familiar with the technical standards to be followed, in accordance with personnel safety and security standards, able to understand all signs of danger. Incorrect installation can result in damage to people and/or property.

WARNING! Live parts. Electric shock. If you have to work on the powered controller, always do it in the presence of a second person. Block remote controls and any power switches.

1.1.2 Worker skills

Below are the minimum skills required to operate the device safely:

Icon	Target	Activities	Skills
	Installer Electrician	▪ System electrical dimensioning ▪ Installation ▪ Start-up ▪ Maintenance ▪ Service calls	Has substantial knowledge in the electrical field. Can understand wiring diagrams and work on live electrical panels, shunt boxes and control devices. Has been certified to work on live parts. Suitable conditions are guaranteed by the application of current standards and regulations on occupational safety in the country of installation. Knows the safety regulations, community directives and all national, regional and corporate rules. This individual must be accompanied by expert personnel if unskilled or young.

1.1.3 Installer and electrician obligations

The installer and the electrician must:

- make sure that the device is installed in systems that comply with all safety and electrical regulations.
- always close the protective cover.

- make sure that the device is used properly and as indicated in chapter "Intended use" on page 7.
- periodically check that the device safety elements are in good condition, replace damaged cables.

1.2 GENERAL WARNINGS



This chapter contains information on your safety but does not assume to be thorough. Contact customer service SELPRO for questions or problems.

1.2.1 Intended use

The device should only be used for the purposes stated in the purchase contract. Other uses or use beyond that specified in the contract are not authorized and the manufacturer cannot be held liable for damages. Foreseen use requires the user carefully reads this instruction manual and especially the safety messages.

1.2.2 Product safety

The product is the result of SELPRO current experience. It must be installed, with any accessory modules, in good working order according to this instruction manual. Use must be within the technical limits stated on the ID plate. Otherwise, faults and damages may occur.

1.2.3 Fault management

Check faulty functions to prevent damages to people or property. For delicate or high value products, consider installing backup controllers with alarm contacts. Faults in farms could harm animals. The system design must meet current directives in the country of installation.

1.2.4 Installation



WARNING! Live parts. Electric shock. Do not work near power and load terminals with the device on.

***NOTICE**: Malfunction. Do not connect two wires to the same input terminal. Request the MEI-4 expansion module.*

DO NOT install the device in environments that could reach high temperatures, higher than the foreseen maximum room temperature.

Assemble the device vertically, with cable input at the bottom, to promote natural heat dissipation and avoid water infiltration; make sure there is sufficient air circulation and free space above and below the controller.

Only use the set holes for connection cable input, always on the bottom, power terminal board side, to avoid external agent infiltration and maintain the controller protection grade. Use the supplied cable clamps, sheath and cables with suitable quality and size.

In the event of disturbed power mains, we recommend installing supplementary anti-disturbance filters directly on the controller power supply.

Only start the controller when the machine that incorporates it is declared compliant with current legislation.

1.2.5 Start-up

WARNING! Electric shock. Risky conditions can be created in the system during start-up due to incorrect settings, defective components or incorrect electrical connections. Keep people away from the work area.

Any faulty fuses must be replaced with new fuses of the same type. Any system fault must be resolved immediately. The system can be potentially dangerous if the system works poorly.

1.2.6 Use

***NOTICE**: before turning on the device, always check that it is correct grounded according to current standards. This is also essential for correct anti-disturbance filter operations.*

If applicable, reassemble and make sure the external protection lid is fully closed.

NEVER touch electrical circuit parts when the power is on.

DO NOT alter or damage the device ID labels.

Avoid continuously turning controller power on/off. Constant power maintains the controller at working temperature and eliminates the problem of condensation forming inside the protective case.

1.2.7 Maintenance

DO NOT tamper with or remove internal controller parts. This voids the warranty and can cause damages to people and property. The controller does not contain parts that can be repaired by the user.

1.2.8 Accessories and spare parts

CAUTION! Only use accessories and spare parts manufactured or recommended by SELPRO. Changes to this device and the use of devices not authorized by SELPRO can create unforeseen and hard to evaluate risks. Contact SELPRO experts to solve your system needs.

1.3 PROTECTIONS

1.3.1 Power supply protection

The controller includes protection against transitory over voltage on the power mains and a three-phase anti-disturbance filter to meet electromagnetic compatibility standard limits.

2. Receiving and storage

2.1 Handling and storage

2.1.1 Handling

***NOTICE**: device damages. Always use packaging. Avoid bumps, strong vibrations and exposure to very high temperatures.*

2.1.2 Storage warnings

***NOTICE**: device damages. Consult the manufacturer and check the warranty conditions if the device is to be stored for a long period of time. Protect against vibration, moisture and shock. Store with a well-closed lid in a dry place. Avoid exposure to very low or very high temperatures.*

2.1.3 Environmental storage conditions

See chapter "Electrical specifications" on page 33.

2.2 Product identification

2.2.1 Package contents

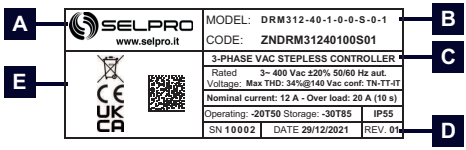
Below are the items provided in the sales package:

- one DRM
- this manual
- for models with case, four brackets for wall mounting
- for models with case, cable clamps or plugs (as per order)

Always check the integrity of the product. In case of damage, contact SELPRO technical support.

2.2.2 Identification label

Model, product code and serial number must be communicated to SELPRO technical support for service calls.



Part	Description
A	Logo and site
B	Model, code and product revision
C	Device description
D	Technical specifications
E	Matrix code to identify model and serial number, CE marking conformity with directives

3. Product description

3.1 Description

3.1.1 DRM controllers

Multifunction and multi-input DRM controllers regulate the speed of voltage adjustable high-speed, three-phase, asynchronous motors applied to axial or centrifugal fans. The controllers act as power units in Slave mode but are set-up for Master mode operation. In fact, transducers or sensors can be connected and the programming display (optional) and be installed to modify parameters and configurations.

3.1.2 Applications

DRM controllers are suitable for HVAC/R environment applications with voltage adjustable high-speed asynchronous motors, for example, ventilated heat exchangers used in air conditioning and refrigeration systems.

3.1.3 How they work

DRM controllers are three-phase voltage transformers that use the principle of phase partialization or phase cut-off. Partialization is totally controlled on the three phases, regulating the effective voltage applied to the load. During installation, the motor cosϕ can be taken into account and manually compensated. Neutral conductor connection is not required. The controller normally operates in Slave mode but can be configured for Master mode operation using the programming display (optional).

3.1.4 Inputs

The controller has the following inputs:

- two analog inputs that can be configured to read the voltage/current signals (can be amplified with expansion modules)
- one optoisolated non-polarized input for the PWM signal
- two On/Off for activation of auxiliary functions

3.1.5 Outputs

The controller has the following outputs:

- control outputs:
  - one power for three-phase motors (models 308, 312, and 320)
  - two power for three-phase motors (models 328)
  - one in analogue voltage 0–10 Vdc for power slave units: the voltage 0-10 V follows the input (see "Operating mode" on page 25)
- one relay, for alarm, fault and operating status messages

3.1.6 Control

Therefore, slave proportional control varies the three-phase output proportionally to the input value.

3.1.7 Functions that can be activated with On/Off inputs

The following controls are possible via the On/Off inputs:

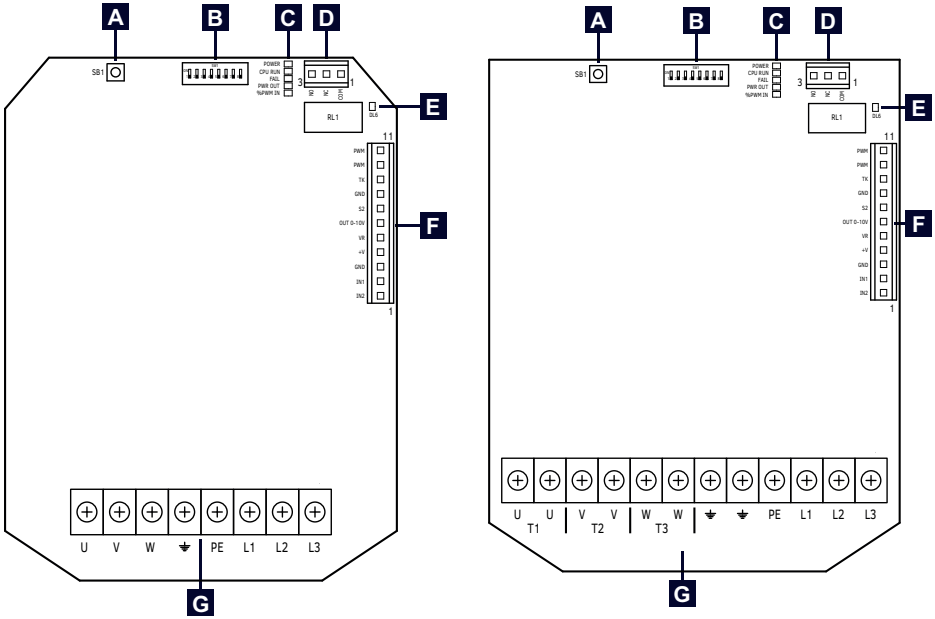
- remote enabling of start/stop
- read motor overheat protection status

3.1.8 Default configurations

The DRM controller has three configurations for Slave proportional control: current, voltage or based on PWM signal.

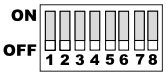
3.2 Presentation

3.2.1 Main components



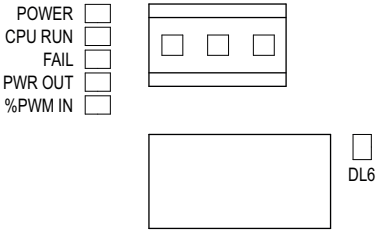
Part	Description	Reference in the manual
A	Reset button.	-
B	DIP switch SW1 to turn functions on/off.	"DIP switch SW1" on page 12
C	Device status LED.	"Status LED" on page 12
D	Terminal board M4 with relay output.	"Relay output" on page 16
E	LED **DL6** relay status.	"Relay status LED" on page 13
F	Terminal board M3 with analog inputs and analog control output.	"Analog inputs and outputs" on page 15
G	Terminal board M1 three phase voltage input and output.	"Three-phase power supply and power output for motor(s)" on page 14

3.2.2 DIP switch SW1



Switch	Function
1	Sets the type of analogue command input: ■ On: 4-20 mA ■ Off: 0-10 Vdc or PWM
2	Sets the control mode: ■ On: inversely proportional to the command signal ■ Off: directly proportional to the command signal
3	Sets the **TK** contact operation (terminal board M3): ■ On: NO contact. Function not available. ■ Off: NC contact. Serial connection of the motor overload protections (**TK**).
4	Sets the **START/STOP** contact operation (terminal board M3): ■ On: ○ Closed contact: start ○ Open contact: stop ■ Off: ○ Open contact: start ○ Closed contact: stop
5	Set the behavior of the relay in the various operative states and in the event of a fault. See "Behavior of relay and LED DL6 to indicate the operative and fault states" on page 13.
6	
7	Enables/disables editing parameter **cosϕ**: ■ On: enables manual editing of the parameter. See "Modify the cosϕ of the motor" on page 29 ■ Off: disables manual editing of the parameter
8	Function not available.

3.2.3 LED overview



3.2.4 Status LED

Name	Description
PWR	Power on
CPU RUN	■ Blinking fast: micro controller running ■ Blinking slowly (on its own): manual setting of the motor cosϕ active ■ Blinking slowly (with the **PWR OUT** LED blinking): standby

Name	Description
FAIL	***Note**: if multiple alarms are present, the one with highest priority is indicated.* ■ 1 flash: temperature of the board greater than 85 °C ■ 2 flashes: power phase missing ■ 3 flashes: motor overload protection open ■ 4 flashes: input value out of range see "Minimum and maximum limits for inputs IN1 and IN2" on page 30. For the causes and resolutions of the alarm messages, see "Alarm messages" on page 30.
PWR OUT	■ On: output voltage distribution ■ Blinking: standby, no voltage distribution but controller ready ■ Off: no output voltage distribution
%PWM IN	The varying intensity indicates the percentage of the PWM command signal

3.2.5 Relay status LED

Name	Description
DL6	Alarm relay status/external unit control. ■ on: relay energized (closed between **COM**-**NO**) ■ off: relay at rest (closed between **COM**-**NC**)

3.2.6 Behavior of relay and LED DL6 to indicate the operative and fault states

The behavior of the relay depends on the settings of switches 5 and 6 of the DIP switch.

***Note**: the relay is energized with contact COM-NA closed; the relay is at rest with contact COM-NC closed.*

Operative status	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6 7 8
Stop	Relay energized	Relay de-energized	Relay de-energized	Relay energized
Standby	Relay energized	Relay energized	Relay de-energized	Relay energized
Alarm	Relay de-energized	Relay de-energized	Relay de-energized	Relay energized
Normal operation	Relay energized	Relay energized	Relay energized	Relay energized
Manual setting of cosϕ	Relay energized	Relay energized	Relay energized	Relay energized
No power supply	Relay de-energized	Relay de-energized	Relay de-energized	Relay de-energized
Insufficient power supply	Relay de-energized	Relay de-energized	Relay de-energized	Relay energized
Device faulty	Relay de-energized	Relay de-energized	Relay de-energized	Relay energized
No power supply phase	Relay de-energized	Relay de-energized	Relay de-energized	Relay energized

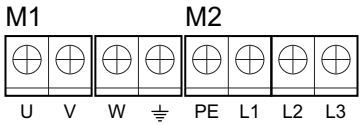
4. Inputs and outputs

4.1 Three-phase power supply and power output for motor(s)

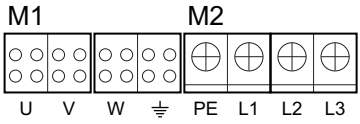
4.1.1 Terminal board M1

Three-phase power supply and output to fan groups with total absorption within the adopted DRM model limits.

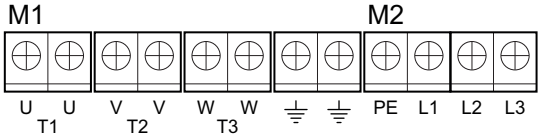
Terminal board DRM308, DRM312, DRM320 single output



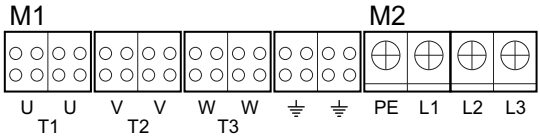
Terminal board DRM308, DRM312, DRM320 output x 4



Terminal board DRM320, DRM328 double output



Terminal board DRM320, DRM328 output x 8



Terminal	Description
U/T1	Phase output 1 **(*)**
V/T2	Phase output 2 **(*)**
W/T3	Phase output 3 **(*)**
⏚	Auxiliary grounding to be used for the load, internally connected to PE.
PE	Protection circuit breaker connection terminal **(**)**.
L1	Phase input 1
L2	Phase input 2
L3	Phase input 3

***Note**(*): double three-phase output on models DRM328.*

***Note** (**): the device can be installed in TT (e.g., domestic users in Italy), IT (to ensure maximum operating continuity) and TN (users with their own transformer cabin) voltage distribution systems. Each of these systems provides different ways to ground the power source and the metal system masses.*

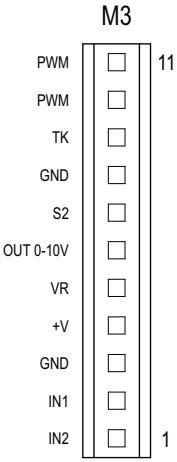
4.1.2 Power supply wiring diagram

See "Power supply wiring and power output for motor(s)" on page 20.

4.2 Analog inputs and outputs

4.2.1 Terminal board M3

***Note**: MEI-4 module is available to expand inputs. Contact SELPRO customer service.*



Terminal		Description	Specifications
1	**IN2**	Analog Input 2.	V dc/mA
2	**IN1**	Analog Input 1.	V dc/mA
3	**GND**	Grounding.	-
4	**+V**	Non-stabilized power voltage output.	20 V dc Max 20 mA
5	**VR**	Stabilized power voltage output.	5–10 V dc Max 5 mA
6	**OUT**	Powered output used to command the auxiliary power slave unit. ***Note**: the 0-10 V output follows the trend of the input signal in a directly proportional manner. It is not affected by the position of switch 2 of the DIP switch).*	0–10/10–0 Vdc Max 30 mA
7	**START/STOP**	NO/NC contact (can be configured with the DIP switch) for the remote start/stop command. **CAUTION!** The contact does not disconnect the mains power. Do not use it as a power switch or as a safety switch.	-
8	**GND**	Grounding.	-
9	**TK**	Normally closed (NC) contact to connect to the motor overload protections: ■ closed: no alarm, consent to regulation ■ open: alarm, no consent to regulation ***NOTICE**: the overload protection of one or more motors or an alarm coming from an electrical cabinet can be connected to the TK input but must be normally closed logic.*	-
10	**PWM**	Optoisolated input, not polarized for control signal 0–10 Vdc in PWM modulation.	3–30 Vdc/10 mA
11	**PWM**		

***Note**: outputs **V+** and **VR** are protected against short-circuit to **IN1**, **IN2** and **GND**.*

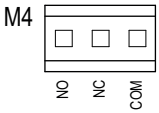
4.2.2 Wiring diagrams

See "Connection to analogue inputs" on page 21 "OUT analog output connections" on page 23 and "Auxiliary On/Off inputs connection" on page 23.

4.3 Relay output

4.3.1 Terminal board M4

The two-logic relay terminal board can be used to control alarm devices (i.e. sirens).



Terminal		Description
1	**NO**	Normally open output (**NO**+**COM**).
2	**NC**	Normally closed output (**NC**+**COM**).
3	**COM**	Shared.

4.3.2 Configuration for communicating operative statuses and malfunctions

It is possible to manage the operative (for example, if the regulator is in alarm) and fault (for example, insufficient power) states in different ways by setting DIP switch SW1 switches 5 and 6, see "Behavior of relay and LED DL6 to indicate the operative and fault states" on page 13.

5. Installation

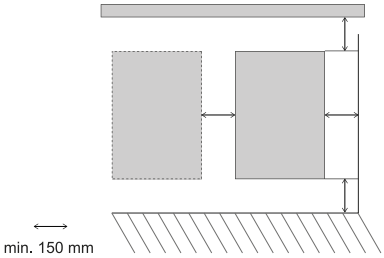
5.1 Wall mount

5.1.1 Important considerations for installation

DRM is a device that allows for different types of installation. Before proceeding, check:

- if the fans are equipped with asynchronous motors that are voltage adjustable, meaning high speed
- if the maximum rated load current is less than or equal to the rated current of the selected DRM model

5.1.2 Guarantee cooling



***NOTICE**: the air must circulate freely in the dissipater without obstacles (below and above the dissipater). Leave a free area between the device and the walls or between several devices in series.*

***NOTICE**: over temperature. In the case of vertical installation of multiple controllers, always measure the air temperature to which the highest controller is subjected.*

5.1.3 Outdoor installation

Only models with IP55 protection rating can be installed in the open. The controller can withstand temperatures below zero only if it is powered. Avoid exposure to direct sunlight.

***NOTICE**: temperature changes. Defective operation. Store the controller at room temperature before installation to avoid condensation.*

5.1.4 Installation in the electric panel

Models with protection ratings IP20 and IP00 must be installed inside an electric panel. Containers of models IP20 have holes which allow air circulation.

5.1.5 Installation in farms

***NOTICE**: ammonia vapors. Avoid installing the controller in the stable. Install it in a separate room.*

5.1.6 Warnings

***NOTICE**: for IP55 and IP20 models, secure the device closed to prevent screws from falling and remaining inside. Always close the unused holes with the plugs. Install the controller vertically with the cable clamps at the bottom.*

5.1.7 Fix devices with IP55 protection ratings to walls

1. Insert the cable clamps or plugs.
2. Drill holes at the fins or fixing holes, according to these instructions:

For DRM	Hole dimensions
308	6 mm
312, 320 (1/4 outputs)	5 mm
320 (2/8 outputs), 328	5 mm

3. Secure the appliance using four screws (not supplied) suited to the wall thickness.

5.1.8 Fix devices with IP20 protection ratings in the electric panel

1. Insert the cable clamps or plugs.
2. Fix the device to the panel using four screws (not supplied).

5.1.9 Fix devices with IP00 protection ratings in the electric panel

***NOTICE**: damages to components. Defective operation. Handle with care and fix the device in a position protected from impact.*

Fix the device to the panel using four screws (not supplied).

5.2 Electrical installation



Operation reserved for an electrician. Has substantial knowledge in the electrical field. Can understand wiring diagrams and work on live electrical panels, shunt boxes and control devices.

5.2.1 Warnings



WARNING! Live parts. Electric shock. If you have to work on the powered controller, always do it in the presence of a second person. Block remote controls and any power switches.

5.2.2 Ground



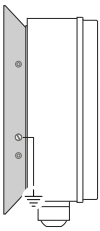
WARNING! Electrocution. Do not power the controller if it is not grounded.

***NOTICE**: if a circuit breaker is installed on the power supply, use a device with a threshold over 100 mA and with a short delay to prevent inopportune power outages*

5.2.3 Connect secondary grounding

To increase the electromagnetic compatibility of the controller, connect the secondary grounding.

For DRM320 (2/8 outputs) and DRM328, to connect the secondary grounding, connect a grounding cable to the dissipater screw.



5.2.4 Protection for short-circuits on load

To protect the controller power modules from severe short-circuits or overloads, it is imperative to use semiconductor protection fuses with a suitable I2t value fitted upstream of the controller.

For additional protection, a circuit breaker with a C-curve can be used, mounted upstream of the partializer.

The installer must install these protections.

Model	Circuit breaker (A)	Fuses			
		A	V ac	Format	I2t semiconductor max (A 2s)
DRM308	16	12	690 V	10 x 38	145
DRM312	20	16			145
DRM320	32	25		14 x 51	470
DRM328	40	32			550

5.2.5 Power cables separate from signal cables

Install the power cables (power and load) separately from the signal cables (analog inputs and auxiliary On/Off inputs/outputs) and keep the maximum distance possible between the cables.

In case of intersection, install with a 90° angle.

5.2.6 Connecting loads and by-passes

The controller allows you to connect three-phase loads without having to connect the neutral. This simplifies installation and allows for a load triangle configuration. Prepare a by-pass switch in order to operate the load even in the event of partializer failure (emergency by-pass).

5.2.7 Warnings for connection and by-pass use

Match phases to avoid destructive short circuits and keep the motor running.

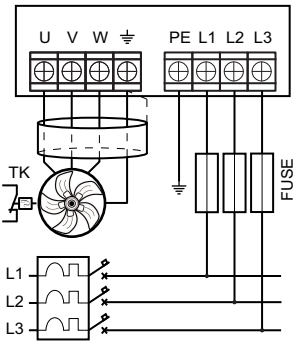
Before powering the load to the maximum voltage, disconnect the power supply to the controller, therefore:

- use a three-position manual shunt as a switching device
- if you use the automatic switch using contactors, ensure a delay of at least two seconds between turning off the controller and turning on the load.

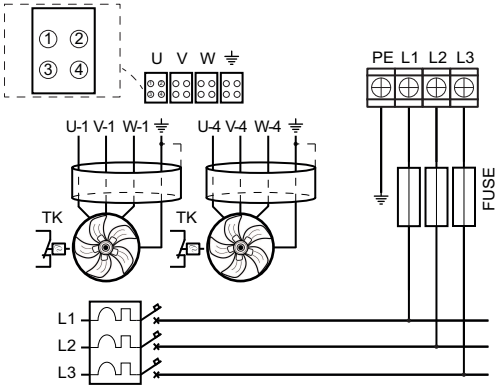
6. Connections

6.1 Power supply wiring and power output for motor(s)

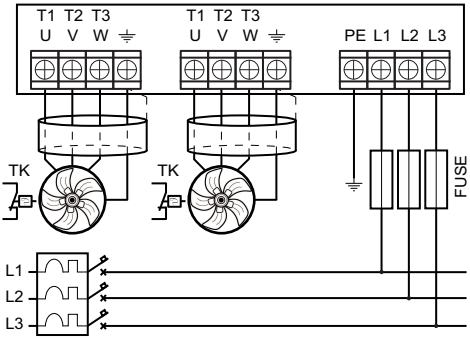
6.1.1 Power wiring diagram and single output load (DRM308, DRM312, DRM320)



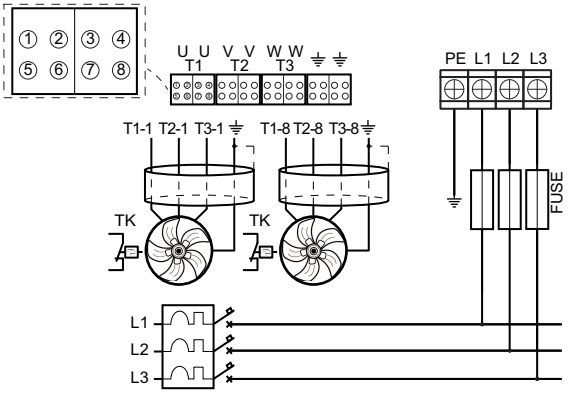
6.1.2 Power wiring diagram and output x4 load (DRM308, DRM312, DRM320)



6.1.3 Power wiring diagram and single output load (DRM320 and DRM328)



6.1.4 Power wiring diagram and output x 8 load (DRM320 and DRM328)



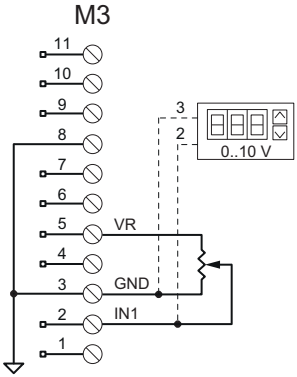
6.2 Connection to analogue inputs

***NOTICE**: for connections longer than 30 m, use a shielded cable and connect the shield directly to ground.*

6.2.1 Connection to inputs with 0–10 V signal

The connection of a potentiometer for manual control or, alternatively, a remote controller with 0–10/10–0 Vdc output is illustrated in the diagram. If you use a shielded cable, ground the shield directly.

This connections requires setting switch 1 of DIP switch SW1 to Off.

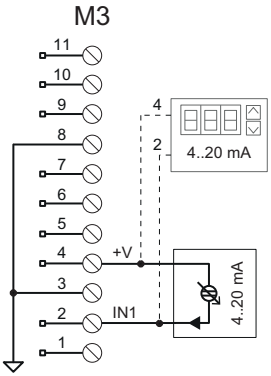


6.2.2 Connection for inputs with 4–20 mA signal

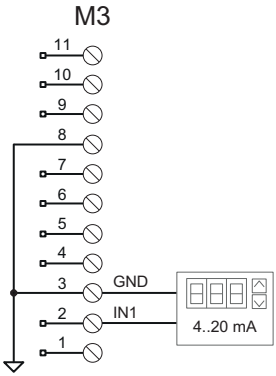
The connection of a potentiometer for manual control or, alternatively, a remote controller with 4–20/20–4 mA output is illustrated in the diagram.

This connection requires setting switch 1 of DIP switch SW1 to On.

Signal taken from + 24 Vdc



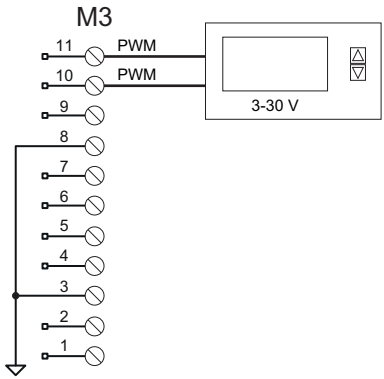
With grounded return signal



6.2.3 Connection for input with PWM signal

The connection to a remote connection with PWM 3-30 V/10 mA output is illustrated in the diagram.

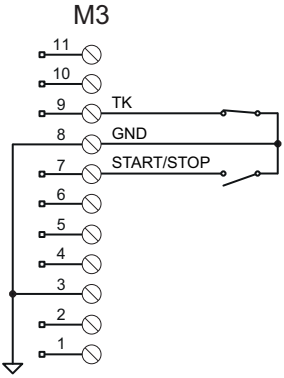
This connections requires setting switch 1 of DIP switch SW1 to Off.



6.3 Auxiliary On/Off inputs connection

6.3.1 Start/stop and TK contacts connection

The diagram shows the contact connections for the remote Start/Stop command and the contact for connection of the motor overload protections. The function of the contact can be configured with DIP switch SW1. See "DIP switch SW1" on page 12.

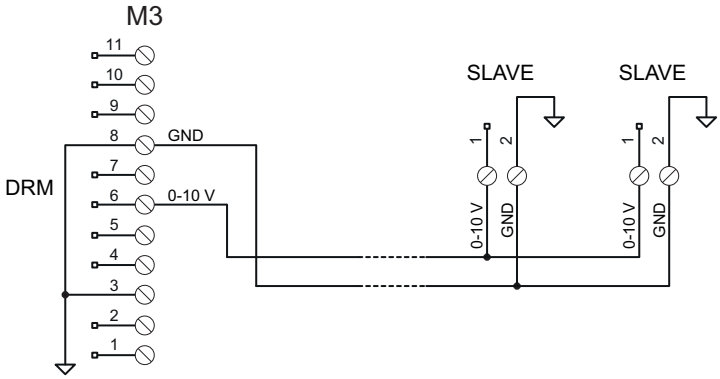


6.4 OUT analog output connections

6.4.1 Power Slave unit connection

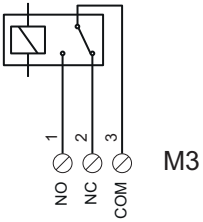
This connection is indicated for a Master unit or one or more Slave power units.

The connection enables the **OUT** analog output to transmit the direct regulation command to the connected Slave units, setting the same operating speed for all connected fan units. The regulation mode is fixed (see "Control output OUT 0-10 V" on page 27) and does not depend on switch 2 of DIP switch SW1.



6.5 Relay output connection

6.5.1 Connection to external systems for communicating alarms, faults or operating states.



7. Operating mode

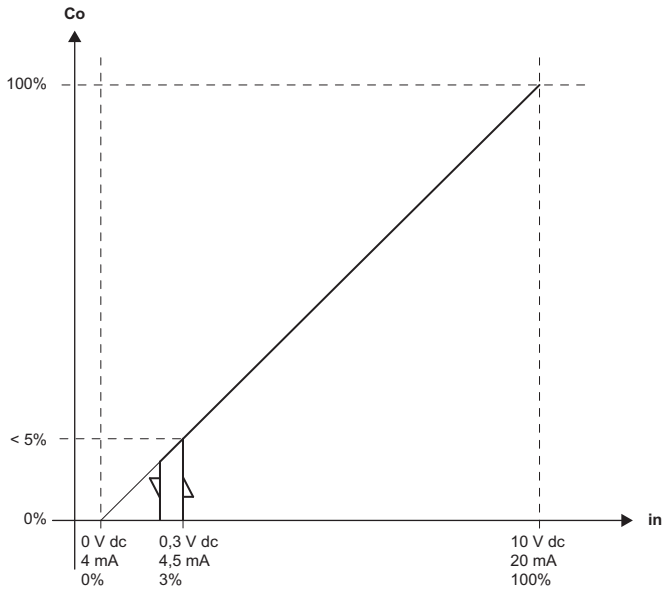
7.1 Slave proportional mode

7.1.1 Operation

The three-phase output voltage varies directly or indirectly proportional to the input.

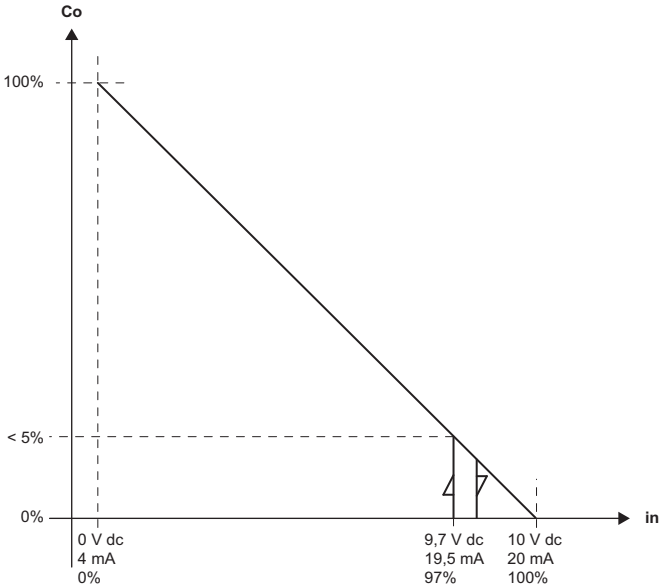
7.1.2 Direct Slave control

Switch 2 of DIP switch SW1 = off



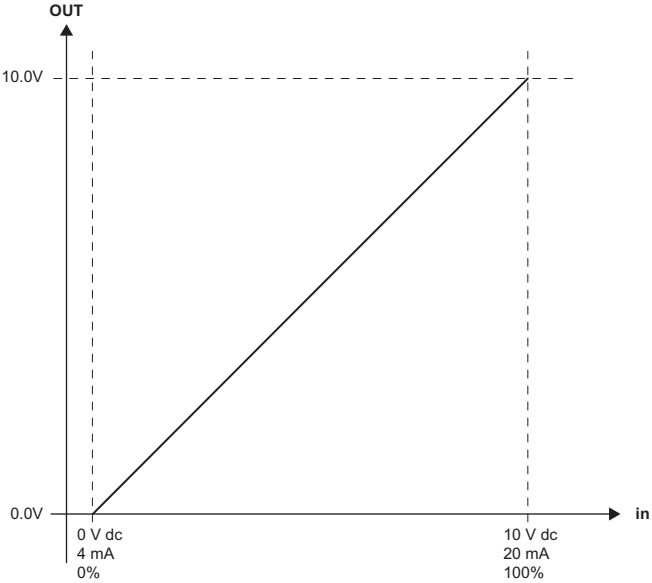
7.1.3 Inverse Slave control

Switch 2 of DIP switch SW1 = on



7.1.4 Control output OUT 0-10 V

The output signal is directly proportional to the input signal and does not depend on the position of switch 2 of DIP switch SW1.



8. Use the controller

8.1 Start-up

8.1.1 Warnings

CAUTION! Check again that the equipment and wiring are correct as required in this manual. Make sure that the fan absorption does not exceed the maximum stated on the identification label. Keep people or things out of the work area.

8.1.2 Start-up procedure

Follow this procedure for correct controller start-up:

Step	Task	Reference in the manual
1	Complete all electrical power connections at mains voltage.	"Electrical installation" on page 18
2	Complete the input connections and remote controls.	"Connection to analogue inputs" on page 21 "Auxiliary On/Off inputs connection" on page 23 "OUT analog output connections" on page 23 "Relay output connection" on page 24
3	Turn on power.	-
4	Set the controller operation using DIP switch SW1.	"DIP switch SW1" on page 12

8.2 Default configurations

8.2.1 Configuration description

Three preset configurations are available that receive a signal on the input and replicate it in proportion on the power output:

IN1/IN2 input	Configuration
0–10 V dc Ri= 10 kΩ	0–10 V dc
4–20 mA Ri= 100 Ω	4–20 mA
3–30 Vdc/10 mA	PWM

8.3 Set the DIP switch

8.3.1 Getting started

Based on the switch settings, the functions enabled change. For details on setting the switches, see "DIP switch SW1" on page 12. For detailed information on the settings of switch 7, see "Modify the cosϕ of the motor" on page 29.

8.3.2 Set the switches

1. With the controller powered on, set the switch to the desired position.
2. Press the reset button: the **FAIL** status LED turns on.
3. Wait for the controller to restart: the **FAIL** status LED turns off.

8.4 Modify the cosϕ of the motor

8.4.1 Getting started

Setting the **cosϕ** parameter, it is possible to change the motor cosϕ factory value.

8.4.2 Set the cosϕ parameter

***NOTICE**: procedure reserved for expert personnel.*

1. Connect a 10 kΩ potentiometer to one of the analogue inputs (**IN1**/**IN2**).
2. Set switch 7 of DIP switch SW1 to ON. See "Set the DIP switch" on page 28.
3. Using the potentiometer, set the cosϕ perimeter to the desired value. When modifying, check the wave shape of the output current of one phase using an oscilloscope and a current transducer.
4. Set switch 7 of DIP switch SW1 to Off.

9. Diagnostics

9.1 Troubleshooting

9.1.1 Reset alarm

The alarms are not saved. To deactivate an alarm, the cause that generated it must be removed.

CAUTION! The controller automatically restarts as soon as the alarm condition is cleared.

9.1.2 Alarm messages

In the case of an alarm, the red FAIL LED turns on and flashes in different patterns based on the type of alarm.

***Note**: the alarm with highest priority is indicated. The priority is equal to the order with which the alarms are listed in the table (1 flash = more severe alarm).*

Number of flashes	Cause	Solution
1	Regulation stopped due to board exceeding the maximum working temperature (85 °C)	Check that the controller is installed in a ventilated room away from direct sunlight. Make sure room temperature is under 50°C. Make sure the controller is correctly installed, see "Wall mount" on page 17.
2	No phase on the power supply	Make sure the power cables are correctly connected and that the terminal board screws are tight. If applicable, make sure the fuses in series at power supply are integral.
3	External overload protection contact open **TK** (with SW1-switch 3 = Off)	Make sure the connected circuit breakers are closed and correctly connected in series. Make sure the wires are correctly connected to the **TK** contact and that the screws are tight.
4	Input signal less than or greater than the minimum value. See "Minimum and maximum limits for inputs IN1 and IN2" on page 30	Check the signal value on the external control unit. Make sure the external control unit is operating correctly.

9.1.3 Minimum and maximum limits for inputs IN1 and IN2

Following are the minimum and maximum limits with a precision of ±5%.

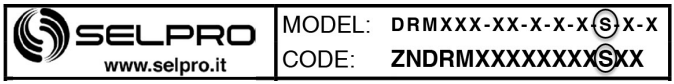
Configuration	Minimum limit	Maximum limit	Unit of measure
PWM	-	-	%
0-10 Vdc	-	> 11	V dc
4 - 20 mA	< 2	> 24	mA

10. Technical specifications

10.1 Physical properties

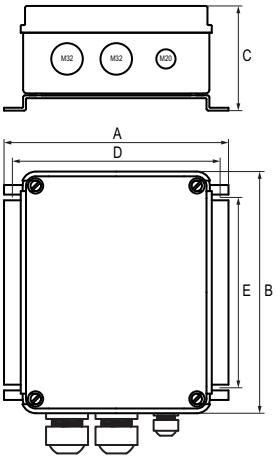
10.1.1 Dimensions and weight of IP20 and IP50 models with low bottom (code S)

***NOTICE**: provide space around the controller as indicated in "Guarantee cooling" on page 17.*

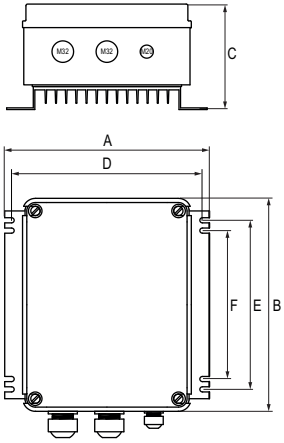


Model	A (mm)	B	C	D	E	F	Weight (kg)
DRM 308	235	255	114	220	200	-	2.5
DRM 312	230	255	128	220	200	170	2.9
DRM 320 (1/4 outputs)	230	255	158	220	200	170	3.9
DRM 320 (2/8 outputs)	236	350	203	174	320	-	5.4
DRM 328	236	350	203	174	320	-	5.6

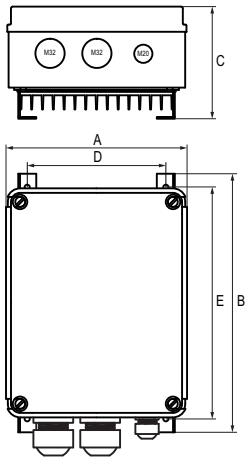
DRM 308



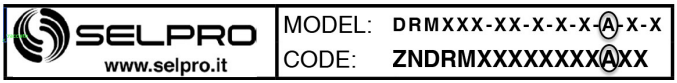
DRM 312, 320 (1/4 outputs)



DRM 320 (2/8 outputs), 328

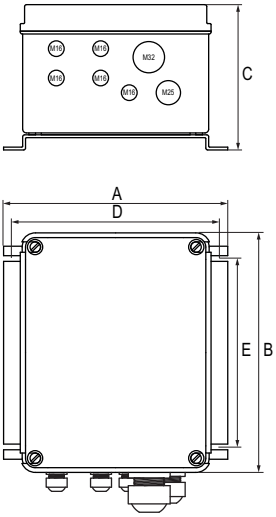


10.1.2 Dimensions and weight of IP20 and IP50 models with high bottom (code A)

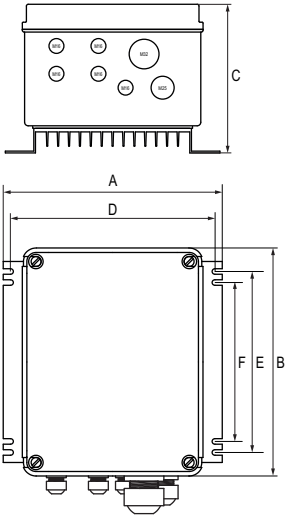


Model	A (mm)	B	C	D	E	F	Weight (kg)
DRM 308	235	255	154	220	200	-	2.7
DRM 312	230	255	168	220	200	170	3.1
DRM 320 (1/4 outputs)	230	255	198	220	200	170	4.1
DRM 320 (2/8 outputs)	236	350	253	174	320	-	5.6
DRM 328	236	350	253	174	320	-	5.8

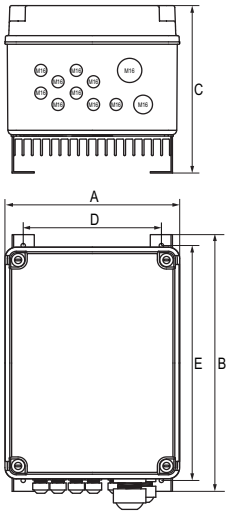
DRM 308



DRM 312, 320 (1/4 outputs)



DRM 320 (2/8 outputs), 328



10.1.3 Case and cable clamps

Materials	GW-PLAST 75 maximum temperature 60 °C (ball heat sealing 85 °C) and aluminum.
Screw plugs	TPN series with max 1.8 Nm torque (CEI 23-58)
Protection rating	IP55 or IP20 (for model with square container)
Pollution	High Pollution
Fire resistance	Category D
M16, M20, M32 cable clamps	IP67 protection, class V2, polyamide PA6
M25 cable clamps	IP67 protection, class V2, polyamide PA6

10.1.4 Storage and installation environmental conditions

Working temperature	from -20 to +50 °C
Storage temperature	from -25 to + 60 °C
Humidity	RH < 85% non condensing
Vibrations	Under 1 G (9.8 m/s2)

10.2 Electrical specifications

10.2.1 Applications

High-speed, three-phase, asynchronous motors with adjustable voltage applied to axial or centrifugal fans.

10.2.2 Specifications

Rated voltage	400 V ac ± 20% three-phase On request 230 V ac / 480 V ac
Frequency	50/60 Hz automatically recognized
Minimum current	0.2 A
Over voltage protection	Surge category II (4 KV), EN 61000-4-5
Auto restart	The controller automatically restarts as soon as the alarm condition is cleared.
Transducer power supply	20 Vdc - 20 mA, not stabilized. Protected against short circuiting.
Potentiometer and sensor power supply	10 Vdc/5 Vdc (automatic switching), stabilized with protection.

10.2.3 Rated current and power

Model	RMS rated current Ampere (In)	Three-phase output	Environmental temperature downgrade > 50 °C (A/°C)	Rated power nominal kVA @ 400 V ac	Dissipated power command circuits	Power dissipated in the area
DRM308	8	Single, x4	0.6	5.5	10 W	48 W @ 12 A
DRM312	12	Single, x4	0.6	8.0	10 W	72 W @ 12 A
DRM320	20	Single, x4, double, x8	1	13.0	10 W	120 W @ 20 A
DRM328	28	Double, x8	1.4	17.0	10 W	168 W @ 28 A

10.2.4 Nominal current declassified due to height of installation

Installation height (m)	0	1000	1500	2000	2500	3000	3500
Rated current reduction (%)	100	95	90	85	80	75	70

10.2.5 Electric insulation

Case	Class I (use of grounded protection conductor)
Command circuits	4000 V ac between command input and mains voltage parts

10.2.6 Nominal cable sections

	Signal (min–max values)		Power output (min–max values)		Power supply (min–max values)	
Model	**mm2**	**AWG Cu**	**mm2**	**AWG Cu**	**mm2**	**AWG Cu**
DRM308, DRM312, DRM320 (single output)	0.5–1.5	20–16	1.0–2.5	17–13	1.0–2.5	17–13
DRM308, DRM312, DRM320 (output x4)	0.5–1.5	20–16	1.0–2.5	17–13	1.0–2.5	17–13
DRM320 (double output)	0.5–1.5	20–16	1.5–4.0	15–11	1.5–4.0	15–11
DRM320 (output x8)	0.5–1.5	20–16	1.0–2.5	17–13	1.5–4.0	15–11
DRM328 (double output)	0.5–1.5	20–16	1.5–4.0	15–11	1.5–4.0	15–11
DRM328 (output x8)	0.5–1.5	20–16	1.0–2.5	17–13	1.5–4.0	15–11

10.3 Maintenance

10.3.1 Clean Up

Clean the container and/or dissipator with a dry rag.

10.3.2 Responsibility for disposal



As indicated in European Directive 2012/19/EU, do not dispose of the product with other unsorted urban waste.

The owner is responsible for the disposal of these products and of the other electric and electronic equipment using the specific collection organizations indicated by the government or local public agencies.

Correct disposal and recycling help to prevent potentially negative consequences to the environment and health of people.

For more detailed information about disposal, contact the responsible public authorities, the waste disposal service, or the representative from which the product was purchased.

10.4 Conformity

10.4.1 Declaration of conformity

The full text is available on the website www.selpro.it.

10.4.2 EC - Declaration of conformity

Directive	EC standard code	Version
EMC 2014/30/EU	EN IEC 61800-3	2018
	EN IEC 61000-6-2	2019
	EN 61000-6-3	2007 +A1:2011
	EN IEC 55014-1	2021
	EN IEC 55014-2	2021
Safety 2014/35/EU	EN 61800-5-1	2007 +A1:2017 +A11:2021
	EN 60335-1	2012 +A13:2017 +A2:2019
	EN 60730-1	2017
RoHS 2012/19/EU	EN 50581	2012

10.4.3 UK - Declaration of conformity

Subject	Name	Version
EMC	BS EN IEC 61800-3	2018
	BS EN IEC 61000-6-2	2019
	BS EN 61000-6-3	2007 +A1:2011
	BS EN IEC 55014-1	2021
	BS EN IEC 55014-2	2021
Safety	BS EN 61800-5-1	2007 +A1:2017 +A11:2021
	BS EN 60335-1	2012 +A13:2017 +A2:2019
	BS EN 60730-1	2017
RoHS	BS EN 50581	2012

SELPRO Srl

Via Piamarta, 5/11
25021 Bagnolo Mella (BS) Italy

+39 (0)30 6821611
info@selpro.it

SELPRO
Fan Speed Controllers Specialist

www.selpro.it