

# D-Vo

## MARELLI MOTORI DIGITAL AVR



**MarelliMotori**  
Powering the future®



The new Digital Voltage Regulator D-Vo is an electronic microprocessor-based device which manages the operating electrical parameters of synchronous generators. The power supply to the exciter is through a PWM power stage.

The D-Vo AVR can be interfaced and programmed using the standard Modbus communication protocol and a proprietary PC application supplied by Marelli Motori.

The new D-Vo regulator is a standard feature of all generators  $\geq 800$  frame size and all HV (std) generators, it is also compatible with any Marelli Motori generator.

## FUNCTIONS AND KEY FEATURES

- ✓ **4 Operating modes:**
  - Automatic Voltage Regulation (AVR mode)
  - Power Factor Regulation (PF mode)
  - Reactive Power Regulation (VAR mode)
  - Field Current Regulation (FCR mode)
- ✓ **Stability parameters individually configurable (P.I.D.) or pre-defined standard parameterization**
- ✓ **Soft start with adjustable ramp, in AVR mode**
- ✓ **Parallel function with similar generators operated with Reactive Droop Compensation**
- ✓ **Generator protections:**
  - Field over-voltage
  - Field over-current
  - Generator over-voltage
  - Generator under-voltage
  - Generator over-current
  - Loss of sensing
  - Diode monitoring
- ✓ **Excitation limiters (over- and under-excitation)**
- ✓ **Watchdog**
- ✓ **Under-frequency limiter**
- ✓ **FRT detection and management**
- ✓ **Certifications:**
  - CE
  - UL
  - Grid code: compliant with VDE-AR-N-4110

## INPUTS

- ✓ 1-ph or 3-ph generator voltage sensing
- ✓ 1-ph or 3-ph generator current sensing
- ✓ 1-ph grid voltage sensing
- ✓ 3 auxiliary analogue inputs for remote setpoint control
- ✓ Input for external potentiometer
- ✓ 9 digital contacts (8 programmable)

## OUTPUTS

- ✓ PWM output max. 10A continuous, 20A forcing for 10s
- ✓ 3 configurable output relays for alarm and FRT

## FRT

The D-Vo is equipped with a Fault Ride Through (FRT) function that allows to detect the Low Voltage Ride Through (LVRT) or the High Voltage Ride Through (HVRT) and provides a dynamic support of reactive current during the event.

FRT Management options available:

- ✓ Standard
- ✓ AVR mode

# PRODUCT SPECIFICATION



## POWER SUPPLY

TECHNOLOGY	Digital
CONNECTION TYPE	Single phase
	Three phase
POWER SOURCE	Shunt
	Auxiliary winding
	PMG
	Separate AC source
VOLTAGE RANGE	Separate DC source
	AC: up to 250Vac (50Hz to 400Hz)
	DC: up to 300Vdc
	Voltage build-up: 5Vac

## CONTROL SUPPLY

CONNECTION TYPE	Single phase
	Three phase
POWER SOURCE	Shunt
	Auxiliary winding
	PMG
	Separate AC source
VOLTAGE RANGE	Separate DC source
	AC: 24Vac to 250Vac (50Hz to 400Hz)
	DC: 24Vdc to 300Vdc

## GENERATOR VOLTAGE SENSING

CONNECTION TYPE	Single phase
	Three phase
VOLTAGE RANGE	AC: 100Vac to 480Vac $\pm 15\%$ , at 50/60Hz

## GRID VOLTAGE SENSING

CONNECTION TYPE	Single phase
VOLTAGE RANGE	AC: 100Vac to 480Vac $\pm 15\%$ , at 50/60Hz
VOLTAGE SENSING OF THE GRID	Single-phase
	220Vac to 480Vac at 50Hz/60Hz
	Frequency operating range 10Hz to 80Hz

## GENERATOR CURRENT SENSING

INPUTS	3 (6 terminals) for U-V-W phase sensing
CURRENT RANGE OF EACH INPUT	1Aac (50/60Hz)

## REGULATION ACCURACY

AVR MODE	$\pm 0.25\%$ of rated voltage
FCR MODE	$\pm 2\%$ of rated exciter current
PF MODE	$\pm 0.005\text{PF}$ (with PF between 0.9 lagging and 0.9 leading)
VAR MODE	$\pm 2\%$ of rated power
VOLTAGE MATCHING	$\pm 2\%$ of rated voltage

## ENVIRONMENTAL CONDITIONS

OPERATING TEMPERATURE	-30°C to +70°C
STORAGE TEMPERATURE	-40°C to +80°C
HUMIDITY	<90%
DIMENSIONS	335 x 190 x 60 (mm)

## EMC

IMMUNITY	IEC 61000-6-2
EMISSIONS	IEC 61000-6-4
TESTED ACCORDING TO THE FOLLOWING STANDARDS	Burst: IEC 61000-4-4
	Surge: IEC 61000-4-4
	ESD: IEC 61000-4-2
	Conducted immunities LF: IEC 60945
	Conducted immunities HF: IEC 61000-4-6
	Radiated immunities HF: IEC 61000-4-3
	Radiated emissions: CISPR 16, CISPR 11
	Conducted emissions: CISPR 16, CISPR 11
Power interruptions: IEC 61000-4-11	
Voltage variation: IEC 61000-4-11	

## USER INTERFACE

- ✓ 1 USB port for connection to PC with Marelli Motori proprietary software or custom software
- ✓ 1 Ethernet port for connection to PC with Marelli Motori proprietary software or custom software
- ✓ Communication protocol: Modbus RTU (USB), Modbus TCP/IP (Ethernet)

## CONTACTS

### Marelli Motori S.r.l.

Via Sabbionara 1  
36071 Arzignano (VI) - Italy  
(T) +39 0444 479 711  
(F) +39 0444 479 888  
info@marellimotori.com

### Marelli Motori Asia Sdn Bhd

No. 7, Jalan Tajuh Satu 27/29A,  
Section 27, 40400 Shah Alam,  
Selangor Darul Ehsan  
Malaysia  
(T) +60 3 5102 9515  
malaysia@marellimotori.com