

Proportional amplifiers type EMMA

Product documentation



Supply voltage U_B :
Output current $I_{A \max}$:

10 to 30 V DC
3 A



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1**Overview of proportional amplifier type EMMA**

Proportional amplifiers actuate proportional solenoid valves by converting an input signal into a corresponding control current.

The proportional amplifier type EMMA has been developed for direct mounting onto a solenoid valve as a line connector.

It is suitable for controlling proportional single-action and twin solenoids. The integrated magnetic measuring technology allows the neutral position/spool position of directly operated solenoid valves to be monitored.

Important parameters (e.g. input signal, minimum current, maximum current, dither, ramp times, etc.) can be set via a wireless interface using a smartphone or PC.

Features and advantages

- Direct assembly onto the solenoid valves
- Easy commissioning
- Integrated spool position measurement (proportional and digital)
- Control of single, double and twin solenoid valves
- CAN bus interface
- Wi-Fi interface
- Simple diagnostics and status monitoring
- Functions and settings tailored to HAWE products

Intended applications

- For controlling proportional valves in the industry sector
- Neutral position monitoring of a directly operated solenoid valve
- Connection of analogue proportional valves in CAN bus networks
- Closed storage control



Proportional amplifiers type EMMA

2 Available versions

Ordering example

EMMA	-G	-M12	-WL
			2.3 "Data interface"
			2.2 "Electrical connection"
			2.1 "Version"

Basic type

2.1 Version

Coding	Description
G	Line connector for single-action and twin solenoids with socket according to DIN EN 175 301-803
DG	2x line connector for 2 single-action solenoids with socket according to DIN EN 175 301-803

2.2 Electrical connection

Coding	Description
M 12	M12 plug, 5-pin

2.3 Data interface

Coding	Description
WL	CAN interface Wi-Fi interface

2.4 Accessories

Connector

Order coding	M12 plug, straight, can be assembled
Order number	6217 0284-00
Description	M12 connector without cable, with screw terminals, for connecting an individual cable

PEAK-System CAN-USB dongle

Order coding	PCAN-USB ADAPTER
Order number	6964 0021-72
Description	USB-CAN adapter from PEAK-System. For connecting an EMMA to a PC. Please download the driver software from www.hawe.com/edocs to guarantee problem-free operation.

2.5 Software

Web server

Designation	Web server
Description	The EMMA proportional amplifier can connect and communicate with an iOS or Android mobile device or Windows PC via a wireless interface.
Function	▪ Commissioning ▪ Parametrisation ▪ Live data for diagnostics and monitoring ▪ Firmware update

3 Parameters

3.1 General data

Designation	Proportional amplifiers
Version	Line connector
Connection	M12, 5-pole
Attachment	On socket according to DIN EN 175 301-803
Installation position	As desired
Protection class	IP 65 (mounted) according to DIN EN 60529
Operating temperature	-25 to +80°C
Storage temperature	-40 to +80°C

3.2 Weight

	Type	
	EMMA-G	= approx. 70 g
	EMMA-DG	= approx. 130 g

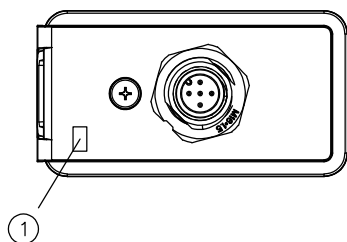
3.3 Electrical data

Supply voltage U_B	10 to 30 V DC, protected against reverse polarity
Output voltage U_A	$U_B - 2 \text{ V}$
Output current I_A , controlled	IPWM output up to 2.5 A
Output current I_A On/Off	to 3 A
Possible analogue input 1	12-bit resolution 0 to 5 V DC, RE = 10 kΩ 0 to 10 V DC, RE = 10 kΩ 4 to 20 mA, RE = 300 Ω 0 to U_B, RE = 10 kΩ +/- 10 V DC, RE = 10 kΩ - PWM, RE = 10 kΩ
Digital input	1x digital input, short-circuit-proof, max. 24 V DC, RE = 10 k Ω Switching point 4.5 V DC All analogue inputs can also be used as a digital input
PWM frequency	100 to 2500 Hz
Dither amplitude l	0 to 100%, default: 0%
Dither frequency f	50 to 400 Hz, default: 100 Hz
Ramp time t_r	0 to 300 s, increase and decrease time can be adjusted separately
Interfaces	- CAN bus (ISO 11898-2 CAN 2.0 A & B) - Wireless interface

Electrical data of the position monitoring

Max. switching current I_s	130 mA
Min. load resistance	220 Ω
Digital output 1	- Low signal: $U_A = 0 \text{ V}$ - High signal: $U_A < U_{bat} - 2 \text{ V}$

LED status display



1 LED indicator

Device status

Colour	Description
Continuously red	Error
Alternating between red and green	Warning
Continuously green	Operational

Radio status

Colour	Description
No blue visualisation	Radio module is inactive
Flashing blue	Radio module active, waiting for connection to be established
Continuously blue	Radio connection established

3.4 Communication

CAN bus

CAN protocol	CANopen, J1939
CAN baud rate	10, 20, 50, 100, 125, 250, 400, 500, 800, 1,000 (all units in kbit/s)
CAN-ID	1 to 127 (default ID = 126)

Wireless

Wi-Fi interface	The web server is installed locally on the EMMA device.
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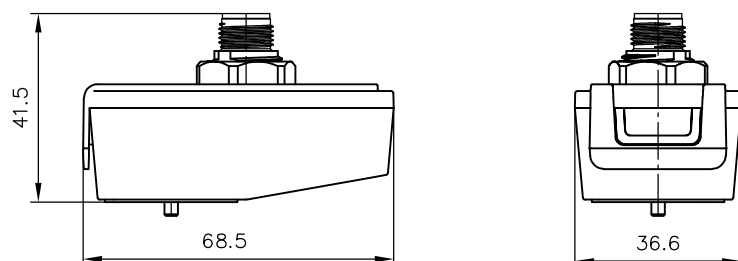
3.5 Standards and directives

EMC Directive	2014/30/EU
Electromagnetic compatibility (EMC)	▪ DIN EN IEC 61000-6-2: 2019-11 ▪ DIN EN 61000-6-4: 2020-09
RoHS directive	2011/65/EU
RED directive	2014/53/EU

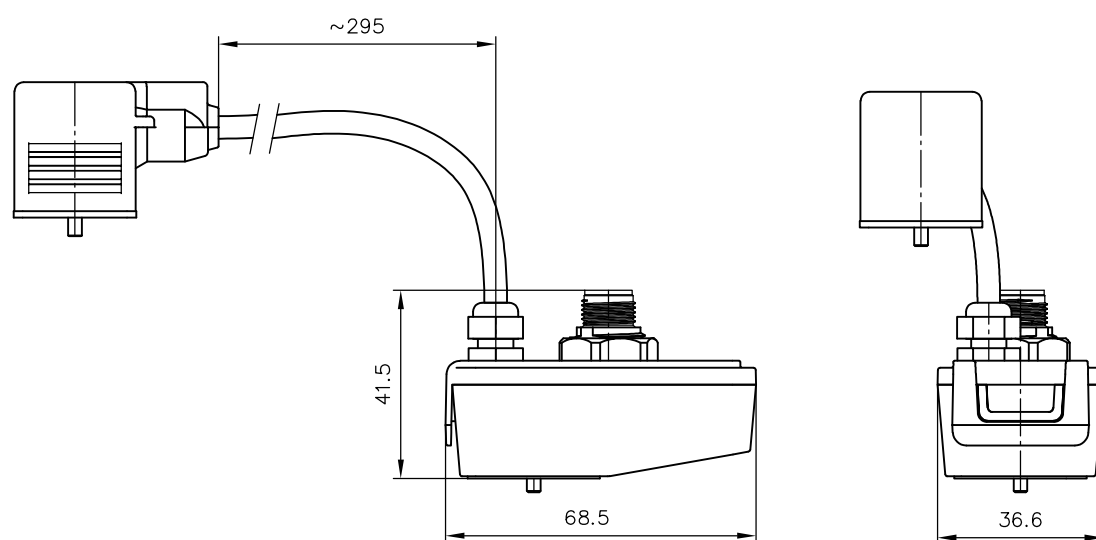
4 Dimensions

All dimensions in mm, subject to change.

EMMA-G..



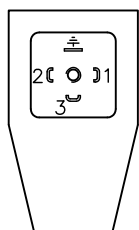
EMMA-DG..



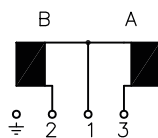
4.1 Electrical connection

Connection pattern (magnet-side)

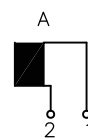
EMMA-G..



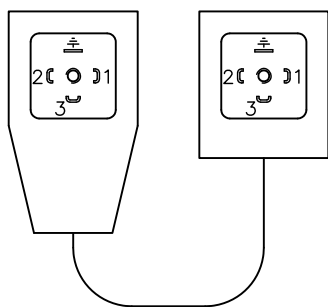
twin solenoid



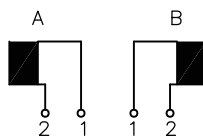
Single-action solenoid



EMMA-DG..

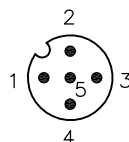


2 single-action solenoids



Layout plan

Signal	M 12
U _B	1
Analogue input 1	2
PGND	3
CAN-H / Digital output 1 / Analogue input 2 *	4
CAN-L	5



* customer-specific programming required

5

Installation, operation and maintenance information

Observe the document B 5488 "General operating instructions for assembly, commissioning, and maintenance."

5.1 Intended use

This product is intended exclusively for hydraulic applications (fluid technology).

The user must observe the safety measures and warnings in this document.

Essential requirements for the product to function correctly and safely:

- ▶ All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- ▶ The product must only be assembled and put into operation by specialist personnel.
- ▶ The product must only be operated within the specified technical parameters described in detail in this document.
- ▶ All components must be suitable for the operating conditions when using an assembly.
- ▶ The operating instructions for the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.
 - ✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to disassembly (in particular in combination with hydraulic accumulators).

DANGER

Sudden movement of the hydraulic drives when disassembled incorrectly

Risk of serious injury or death

- ▶ Depressurise the hydraulic system.
- ▶ Perform safety measures in preparation for maintenance.

5.3 Operating instructions

Observe product configuration and pressure/flow rate.

The statements and technical parameters in this document must be strictly observed.

The instructions for the complete technical system must also always be followed.

NOTICE

- ▶ Read the documentation carefully before usage.
- ▶ The documentation must be accessible to the operating and maintenance staff at all times.
- ▶ Keep documentation up to date after every addition or update.

CAUTION

Overloading components due to incorrect pressure settings.

Risk of minor injury. Parts may burst or fly off, and uncontrolled leakage of hydraulic fluid.

- Pay attention to the maximum operating pressure of the pump, valves and fittings.
- Always monitor the pressure gauge when setting and changing the pressure.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the product. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Swarf
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

NOTICE

New hydraulic fluid from the manufacturer may not have the required purity.

Damage to the product is possible.

- ▶ Filter new hydraulic fluid to a high quality when filling.
- ▶ Do not mix hydraulic fluids. Always use hydraulic fluid that is from the same manufacturer, of the same type, and with the same viscosity properties.

For smooth operation, pay attention to the cleanliness level of the hydraulic fluid (cleanliness level [see Chapter 3, "Parameters"](#)).

Additionally applicable document: [D 5488/1](#) oil recommendations

5.4 Maintenance information

Check regularly (at least once a year) by visual inspection whether the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the surface of the device regularly (at least once a year) (dust deposits and dirt).

References

Additional versions

- Valve control type CAN-IO 14+: D 7845-IO 14
- Proportional amplifier type EV1D: D 7831 D
- Proportional amplifier type EV1M3: D 7831/2
- Proportional amplifier type EV22K5: D 7817/2
- Proportional amplifier type EV2D: D 7821

Application

- 4/2- and 4/3-way directional spool valves type SWPM (SAM, SBM, SCM): D 6420/1
- Proportional directional control valve type POL, PRL, PIL (size 6): D 6394
- Proportional directional spool valve type PSL, PSV size 2 and EDL: D 7700-2
- Proportional directional spool valves types PSL/PSV/PSM, size 3: D 7700-3
- Proportional directional spool valve, type PSL, PSM and PSV size 5: D 7700-5
- Proportional directional spool valve banks type PSLF and PSVF size 7: D 7700-7F
- Proportional directional spool valve banks type PSLF, PSVF size 5: D 7700-5F
- Proportional pressure-limiting valve type PDV and PDM: D 7486
- Directional seated valve type EM and EMP: D 7490/1
- Directional spool valve type CWPN: D 7451 CWPN
- Variable displacement axial piston pump type V60N: D 7960 N
- Variable displacement axial piston pump type V30D: D 7960
- Variable displacement axial piston pump type V30E: D 7960 E
- Proportional flow control valve type SE and SEH: D 7557/1

