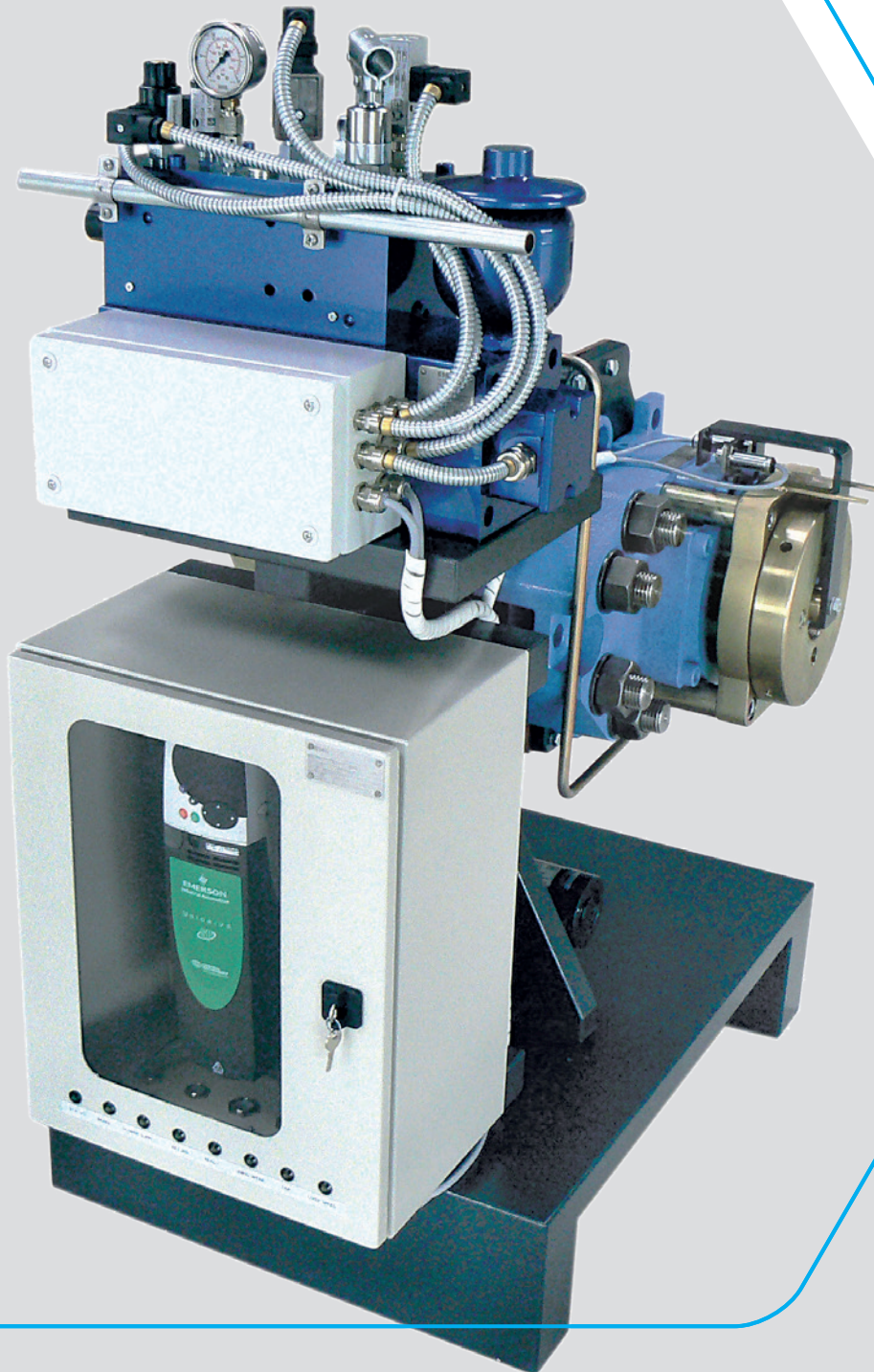


THE ORIGINAL. BE SAFE.

BRAKEMATIC® Brake controls





EMG ELDRO® Electrohydraulic thruster
BRAKEMATIC®

DESIGN

BRAKEMATIC® controls for electrohydraulic drum and disc brakes are consisting of a programmable frequency converter with function modules (software) and an input unit (pedal, internal or external parameterisation interface, process control module with measuring sensor). A frequency change is generated at the output of frequency converter. This frequency change is used for activation of an ELDRO® thruster so that its hydraulic force can be varied. The resultant actuating force of ELDRO® is effective opposite to the braking force of the braking system so that this relation forms the basis for the control of braking operation.

Control system for electrohydraulic brake systems

FUNCTIONS

Pedal type P

... is an electronic pedal control with "manual" parameter presetting for generation of an analogue controlled braking operation. The system permits sensitive braking of travelling operations and rotations. Accuracy of positioning and operational comfort are decisively improved. Especially undesired load change impulses or even oscillation of crane loads can be drastically reduced or even eliminated at all.

Ramp type R

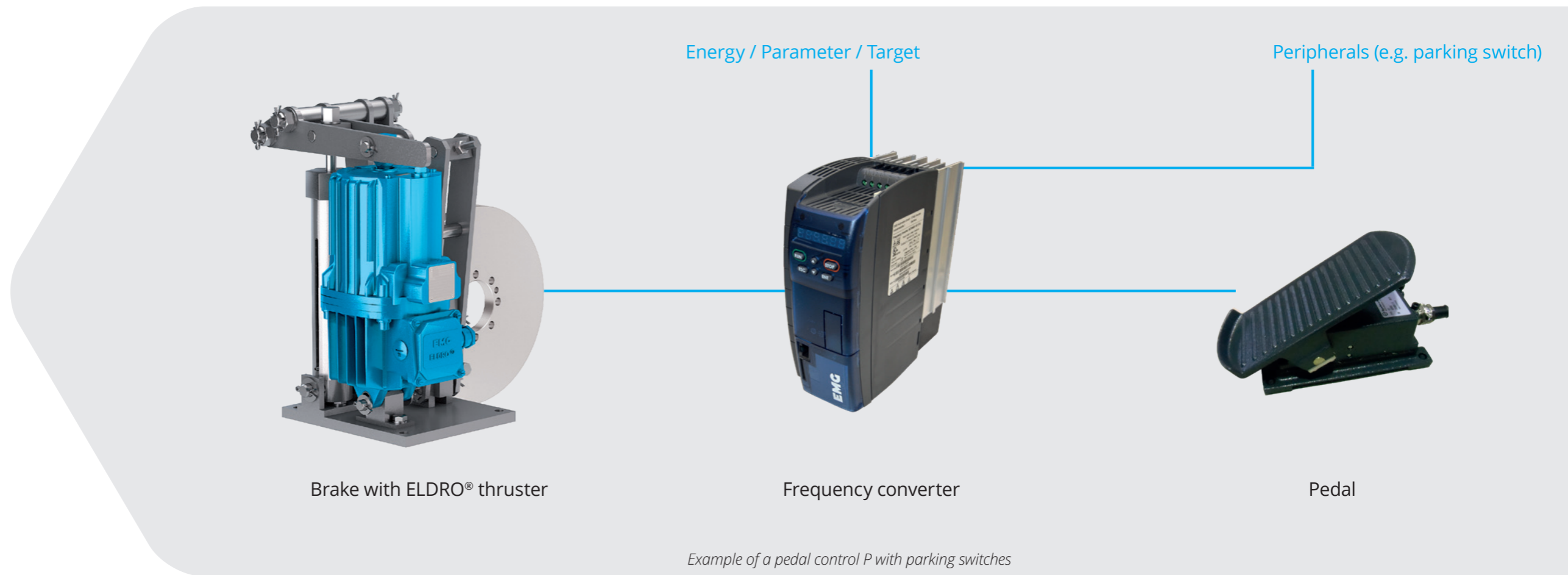
... is an electronic control for the creation of fixed and preprogrammed braking torque characteristics. Thus coercive guided opening and closing movements of brakes are realised. Short braking times, multistage or continuous braking processes are possible according to the preselected ramp function.

The BRAKEMATIC® ramp is offered specifically for remote controlled cranes where crane operation is required with a minimum of control signals. Only a simple control signal is required for activation of the ramp function.

One BRAKEMATIC® control is sufficient for simultaneous operation of a number of brakes, provided the functions and the operation mode of brake systems are identical and the sum of the current input values of all ELDRO® thrusters is in conformity with the selected size of BRAKEMATIC®.

Note:

Working in conjunction with an electro-hydraulic brake, the BRAKEMATIC® control forms one functional unit, i.e. both components are specifically adapted to each other. If one of the components is to be replaced, recalibration of the overall system is necessary.



Brake with ELDRO® thruster

Frequency converter

Pedal

Example of a pedal control P with parking switches

EMG ELDRO® Electrohydraulic thruster **BRAKEMATIC®**

After that, for example a complete shutdown regime may be automatically executed.

Another possible application solution is the automatic control of load-dependent excessive speeds in case of downwards operating belt conveyor systems. One maximum and minimum value each of admissible conveyor speed is acquired as limitation parameter and transmitted to the frequency converter. If the upper limit value is exceeded, the conveyor speed is reduced on the basis of a preselected functional sequence. If the lower speed limit is reached, the frequency converter deactivates the ramp and the conveying system returns to the normal operation mode.

Advance

BRAKEMATIC® advance is an electronic control with variable parameter presetting for generation of controlled brake torque characteristics. In this case an external reference signal (usually rotation) and a programmed presetting parameter (e.g. time, rotation) are evaluated and a linear or nonlinear time function is calculated in the frequency converter. An integral process controller module makes a permanent setpoint/actual value comparison of calculated characteristic and the actual values.

Constant brake times for strip processing plants

Proceeding from the guide signal generated by the controller, the frequency converter modifies the

working frequency at the ELDRO® thruster and thus controls the process of braking operation. Safe adherence to brake time stipulations is the initial prerequisite for the realisation of the shutdown regime of complex belt conveyor systems. This is the only way to provide protection from surcharges caused by asynchronous stoppage of conveyors. The application of BRAKEMATIC® advance is excellently suited for this job since it ensures the preset braking times independent of the conveying direction (up or down) and the loading status.

Antilock system for trackbound travelling

Trackbound travelling and trolley gears are another field of application. Due to unfavourable friction (metal to metal contact) in combination with swaying loads, heavy braking torques, (e.g. caused by operation of EMERGENCY STOP) or adverse climatic influences it might occur that wheels are blocked. In those cases the BRAKEMATIC® advance can be used as antilock system.

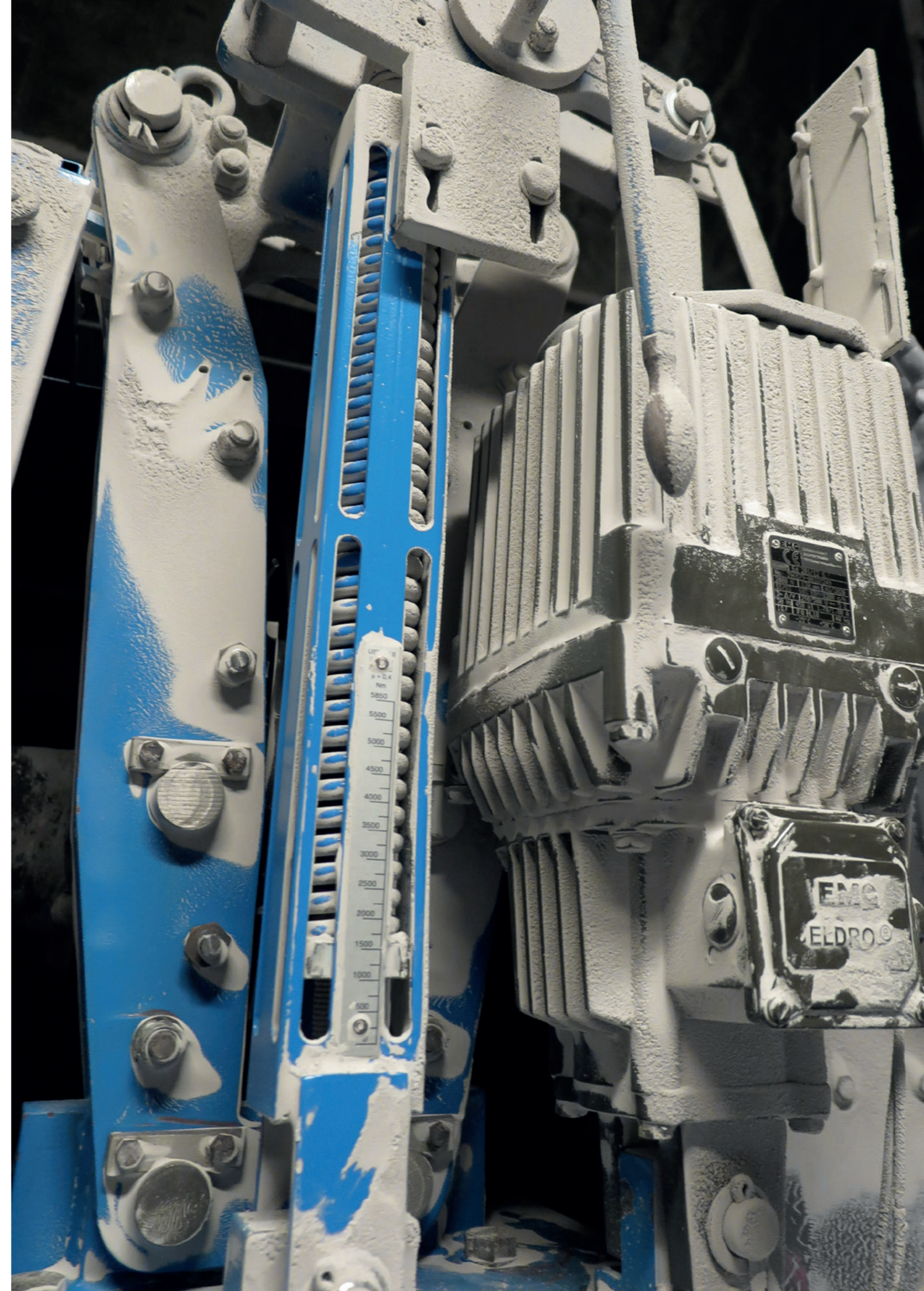


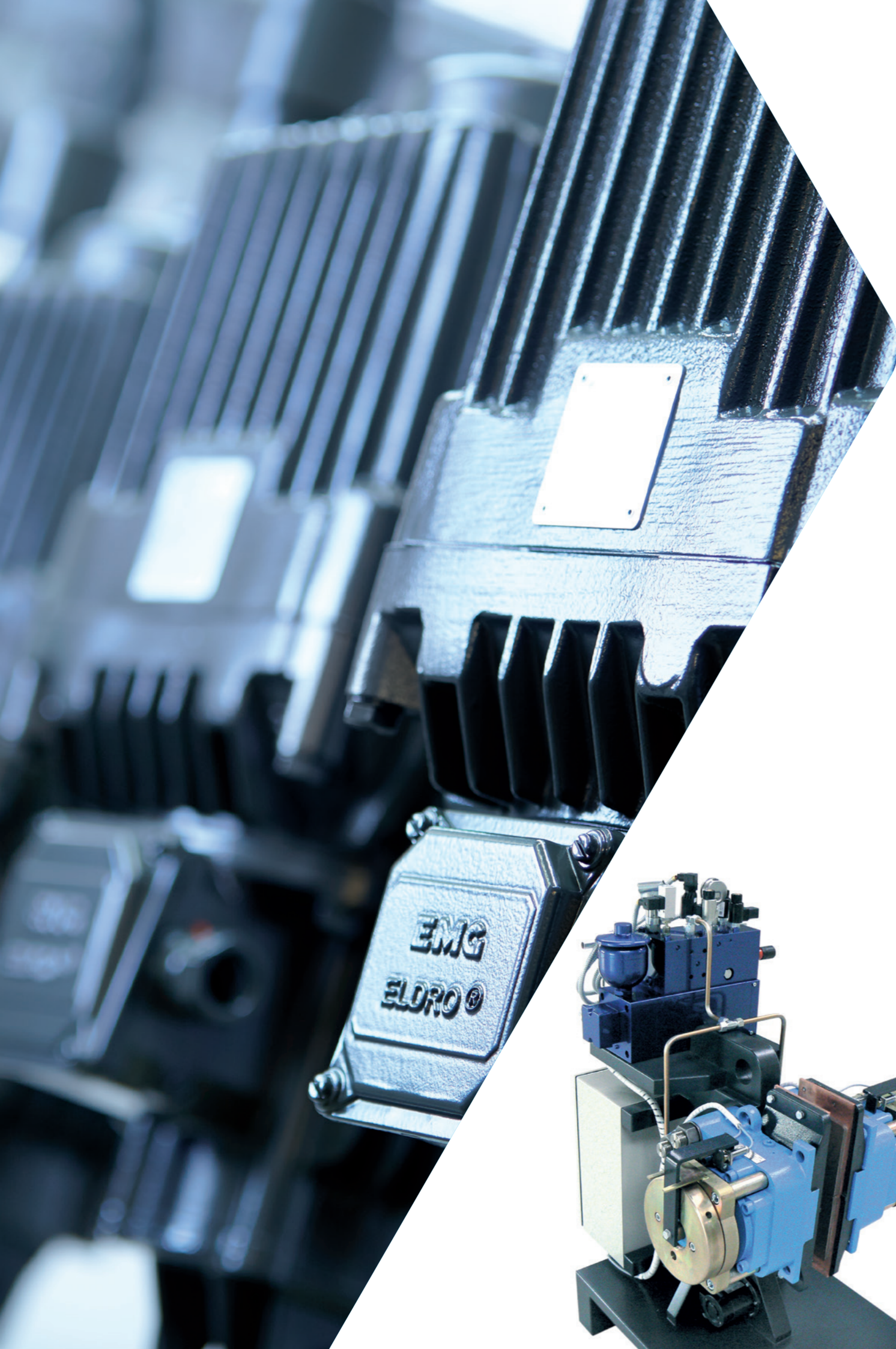
Function of the pedal

Using the pedal, the crane operator can actuate the control system. The lifting power of the ELDRO® brake thruster, and thus the braking torque, are changed in proportion to the pedal travel. When the pedal is not depressed at all, the full lifting power is applied to the ELDRO® brake thruster, and the brake is being lifted. The more the pedal is pressed, the lower is the lifting power on the ELDRO® brake thruster and the higher is the braking torque. A special setting allows a long pedal travel for sensitive variation of the braking torque.

In order to avoid full braking, a progressively acting pull-back spring is incorporated in the pedal. When the crane operator slightly retracts the pedal, the braking torque is reduced accordingly. Thus, all conditions required for safety brakes are complied with.

Example of BRAKEMATIC® underground in the salt mine





EMG ELDRO® Electrohydraulic thruster

BRAKEMATIC®

CONTROL UNIT

	230/... voltage variant	400/... voltage variant
System voltage	1 x 180 to 260 V +/- 0 %, 48 to 62 Hz alternatively 220 to 360 V +/- 0 % DC	3 x 345 to 525 V +/- 0 %, 48 to 62 Hz alternatively 420 to 700 V +/- 0 % DC
Protection class	IP 55 acc. to DIN 40050 (at delivery in housing, otherwise IP 20)	
Ambient temperature	-10 °C to +40 °C at operation up to +50 °C with power reducing of 2.5 % / °C -40 °C to +55 °C at storage	
Surge voltage strength	Class I acc. to EN 50178	
Permitted pollution	Pollution degree 2 acc. to VDE 0110, Part 2	
Permitted moisture stress	Relative humidity 95 %, no condensation	
Influence of altitude	1000 m: 100 % rated current up to 3000 m with reducing the rated current about 10 % / 1000 m	
Vibro stability	In correlation to: IEC 68-2-64 and IEC 68-2-36 IEC 68-2-6 IEC 68-2-29	Test Fh Test Fc Test Eb

Control and thruster lines should be shielded.

Type	System voltage [V] +/- 0 %	System frequency [Hz] +/- 0 %	max. permitted output current [A]	max. length of motor feed line [m]
230/2.2	220...360 V DC	0	2,2	50
230/3.0	220...360 V DC	0	3,0	75
230/4.0	220...360 V DC	0	4,0	75
400/2.1	420...700 V DC	0	2,1	100
400/2.8	420...700 V DC	0	2,8	100
400/3.8	420...700 V DC	0	3,8	100
230/2.2	180...260 V AC	48 - 62	2,2	50
230/3.0	180...260 V AC	48 - 62	3,0	75
230/4.0	180...260 V AC	48 - 62	4,0	75
400/2.1	345...525 V AC	48 - 62	2,1	100
400/2.8	345...525 V AC	48 - 62	2,8	100
400/3.8	345...525 V AC	48 - 62	3,8	100

The control units are designed for wall-mounting with the protection class IP 55. Other versions are available on request. The pedal is intended for floor-mounting. All units comply with the valid standards and protection regulations.

The logo for EMG Automation GmbH, consisting of the letters 'EMG' in a bold, white, sans-serif font.

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