

## Product

Type designation: 41 03ExxKxx  
Part number: 41xx0xxx

This single linear solenoid is used mainly as a switching magnet.

This magnet system is designed for use in potentially explosive atmospheres in category 2 equipment group II.

It is built and tested for ignition protection type increased safety "e" as per DIN EN 60079-7:2015 and EN 60079-0:2012+A11:2013.

## Technical data for magnet type 41 03ExxKxx:

Protection class:	IP54 EN 60529
Ex classification:	 II 2G Ex eb IIC T4 Gb
Approval:	IBExU 16 ATEX 1220 X

## Electrical data for magnet type 41 03E10K00:

Nominal voltage:	24V DC
Voltage tolerance:	+/- 10%
Nominal current:	2.07A
Rated current:	2.12A
Nominal capacity:	49.7W
Rated output:	Max 50.9W
Test voltage:	400V
Duty cycle	100%
Varistor:	SIOV-S14K175 from EPCOS or equivalent
Fuse:	6.3A
Max ambient temperature:	-20°C / +40°C

Nominal voltage:	110V DC
Voltage tolerance:	+/- 10%
Nominal current:	0.43A
Rated current:	0.44A
Nominal capacity:	47W
Rated output:	Max 48.4W
Test voltage:	1120V
Duty cycle	100%
Varistor:	SIOV-S14K550 from EPCOS or equivalent
Fuse:	1.25A
Max ambient temperature:	-20°C / +40°C

## Electrical data for magnet type 41 03E11K00:

Nominal voltage:	24V DC
Voltage tolerance:	+/- 10%
Nominal current:	1.66A
Rated current:	1.71A
Nominal capacity:	39.9W
Rated output:	Max 41.1W
Test voltage:	400V
Duty cycle	100%
Varistor:	SIOV-S14K175 from EPCOS or equivalent
Fuse:	5.0A
Max ambient temperature:	-20°C / +40°C

## Electrical data for magnet type 41 03E11K03:

Nominal voltage:	200V DC
Voltage tolerance:	+/- 10%
Nominal current:	0.24A
Rated current:	0.25A
Nominal capacity:	48W
Rated output:	Max 50W
Test voltage:	1120V
Duty cycle	100%
Varistor:	SIOV-S14K550 from EPCOS or equivalent
Fuse:	1.3A
Max ambient temperature:	-20°C / +40°C

## Electrical data for magnet type 41 03E13K00:

Nominal voltage:	24V DC
Voltage tolerance:	+/- 10%
Nominal current:	2.33A
Rated current:	2.4A
Nominal capacity:	56W
Rated output:	Max 57.7W
Test voltage:	400V
Duty cycle	100%
Varistor:	SIOV-S14K175 from EPCOS or equivalent
Fuse:	6.3A
Max ambient temperature:	-20°C / +40°C

Nominal voltage:	110V DC
Voltage tolerance:	+/- 10%
Nominal current:	0.54A
Rated current:	0.56A
Nominal capacity:	59.9W
Rated output:	Max 61.8W
Test voltage:	1120V
Duty cycle	100%
Varistor:	SIOV-S14K550 from EPCOS or equivalent
Fuse:	1.6A
Max ambient temperature:	-20°C / +40°C

Nominal voltage:	180V DC
Voltage tolerance:	+/- 10%
Nominal current:	0.35A
Rated current:	0.36A
Nominal capacity:	62.9W
Rated output:	Max 64.8W
Test voltage:	1760V
Duty cycle	100%
Varistor:	SIOV-S14K550 from EPCOS or equivalent
Fuse:	0.8A
Max ambient temperature:	-20°C / +40°C

Nominal voltage:	205V DC
Voltage tolerance:	+/- 10%
Nominal current:	0.3A
Rated current:	0.31A
Nominal capacity:	61.9W
Rated output:	Max 63.4W
Test voltage:	1760V
Duty cycle	100%
Varistor:	SIOV-S14K625 from EPCOS or equivalent
Fuse:	0.8A
Max ambient temperature:	-20°C / +40°C

**Electrical data for magnet type 41 03E13K03:**

Nominal voltage:	200V DC
Voltage tolerance:	+/- 10%
Nominal current:	0.29A
Rated current:	0.3A
Nominal capacity:	58.9W
Rated output:	Max 60.7W
Test voltage:	1760V
Duty cycle	100%
Varistor:	SIOV-S14K625 from EPCOS or equivalent
Fuse:	0.8A
Max ambient temperature:	-20°C / max +35°C

**Electrical data for magnet type 41 03E14K00:**

Nominal voltage:	24V DC
Voltage tolerance:	+/- 10%
Nominal current:	3.22A
Rated current:	3.38A
Nominal capacity:	77.2W
Rated output:	Max 81.1W
Test voltage:	400V
Duty cycle	100%
Varistor:	SIOV-S14K175 from EPCOS or equivalent
Fuse:	10.0A
Max ambient temperature:	-20°C / +40°C

**Electrical data for magnet type 41 03E16K00:**

Nominal voltage:	24V DC
Voltage tolerance:	+/- 10%
Nominal current:	3.48A
Rated current:	3.57A
Nominal capacity:	83.4W
Rated output:	Max 85.6W
Test voltage:	400V
Duty cycle	100%
Varistor:	SIOV-S14K175 from EPCOS or equivalent
Fuse:	10.0A
Max ambient temperature:	-20°C / +40°C

## Electrical data for magnet type 41 03E18K00:

Nominal voltage:	24V DC
Voltage tolerance:	+/- 10%
Nominal current:	4.42A
Rated current:	4.54A
Nominal capacity:	106.1W
Rated output:	Max 108.9W
Test voltage:	400V
Duty cycle	100%
Varistor:	SIOV-S14K175 from EPCOS or equivalent
Fuse:	12.5A
Max ambient temperature:	-20°C / +40°C

## Important installation and safety instructions

The magnet system is designed for individual installation. It must not be put into operation if electrical supply lines are damaged, if the magnet housing, armature axis or sheathing show signs of damage, or if you suspect there may be a defect, for example if it is dropped.

The magnet system must be taken out of operation immediately and replaced if the axis is bent or otherwise damaged by external forces. There is a risk that the armature, which is guided in slide bearings, will be blocked and the magnet will therefore no longer be switched.

For all work on the holding magnet, observe the national safety and accident prevention regulations, the instructions in this manual, the values specified on the nameplate and information signs as well as the EU type examination certificate.

In the event of possible damage and claims, the general terms and conditions of delivery of Kendrion (Donaueschingen/Engelswies) GmbH apply.

## Startup

The magnet should only be put into operation by trained and qualified personnel. It may only be connected to the voltage type indicated on the nameplate and the specified voltage value. The device must not be connected when live, and care should be taken to ensure that no conductor insulation is clamped and that the conductor is firmly connected.

To connect, use 2-pole connection wires with a cross-section of 0.5 mm<sup>2</sup> to 4 mm<sup>2</sup> (20 AWG to 12 AWG), the stripping length without crimp end sleeve is max 10 mm, the tightening torque is 0.8 Nm.

Before startup, it is essential to connect a protective conductor to the magnet. Two earthing terminals with a nominal cross-section of 4.0 mm<sup>2</sup> are provided for this purpose. One can be found inside the connection housing and one outside. For the protective conductor, use a nominal cross-section of 4 mm<sup>2</sup> fine-wired or 6 mm<sup>2</sup> single-wire. The maximum tightening torque allowed for the clamping bracket screw is 2 Nm.

To ensure the specified protection class of IP54, the tightening torque for the cover screws for the connection housing must be 2 Nm. The unit nut for the cable fitting must be tightened to 6.67 Nm.

## Maintenance

Any maintenance or repair work required on the magnet may only be carried out by the manufacturer.

## Instructions for Ex zones 1 and 2 / special conditions

The permissible ambient temperature is -20°C to +35°C for magnet type 41 03E13K03 and -20°C to +40°C for all other magnets types.

As short-circuit protection, each magnet requires the upstream connection of a fuse suitable for its rated current (max.  $3 \times I_B$  as per IEC 60127-2-1) or a motor protection switch with short-circuit and thermal quick-release (set to rated current).

For very small rated currents for the magnet, protection with the lowest current value as per the specified IEC standard is sufficient. The fuse can be housed in the associated supply unit or must be connected separately upstream.

The fuse rated voltage must be equal to or greater than the specified nominal voltage for the magnet.

The breaking capacity of the fuse link must be equal to or greater than the assumed maximum short-circuit current at the installation location (usually 1500A).

For all DC version magnets, the permissible ripple is 48%.

Appropriate measures must be in place to ensure that the following cut-off overvoltage (80% of test alternating voltage  $U_{eff}$ , sinusoidal, frequency 45 to 66 Hz) is not exceeded:

At nominal voltage up to 50V: Cut-off overvoltage 400V

At nominal voltage up to 100V: Cut-off overvoltage 640V

At nominal voltage up to 150V: Cut-off overvoltage 1120V

At nominal voltage up to 300V: Cut-off overvoltage 1760V

For varistor selection, see electrical data for each magnet type.

If the cable entry for the magnets is subject to a temperature higher than 70°C or the wire branching point exceeds 80°C, this equipment must also be marked with the higher temperature (information sign at the cable entry). Only a heat-resistant connection cable may be used.

The cable fittings may only be used to insert fixed cables and lines.

If a silicone connection line (or line containing silicone) or a line that is not scratch resistant is used, it must be protected against mechanical damage (e.g. interrupted pipe system with edge protection).

The magnets may only be operated with the duty cycle specified in the electrical data.

When using the magnets, ensure that the permissible ambient temperature range is not exceeded.

Kendrion (Donaueschingen/Engelswies) GmbH

Donaueschingen, 17.07.2017

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Jochen Bulach - ATEX Officer



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# Operating Manual

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Version/revision: 1.1  
Creation date: 22.06.2017  
Last change: 17.07.2017

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