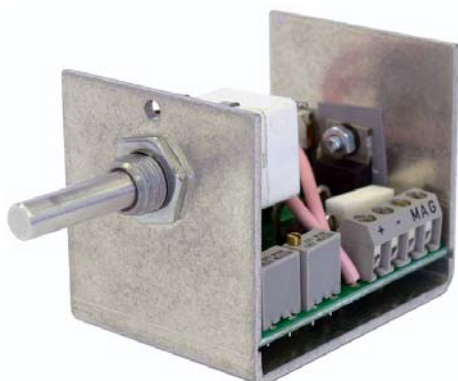


Controller

ESSK 106 and ELSK 106



- Durable, reliable analog technique
- Inclusive being, with On/Off switch
- Reverse polarity
- Short circuit-protected
- Calibrate min. or max. current

1 Proportional amplifier module ESK 106

1.1 Description

The ESK 106 compact amplifier is used to control the solenoid of a proportional hydraulic valve. The current compensation feature ensures that changes in the coil temperature or fluctuations in the supply voltage do not affect the coil current level. It is integrated in a U-profile and can be secured with one nut on, for example, an instrument panel. The front plate must be separately secured. The proportional amplifier requires a smoothed DC power supply in the range 12...30 V. The potentiometer is provided with an integral on/off switch. The current at the power output varies lin-

early with the knob rotation of the potentiometer. With the aid of two trimming potentiometers, both minimum and maximum current values can be set. The amplifier switches off automatically for the duration of any short circuit at the load terminals. Within the amplifier, a quenching diode is connected in parallel with the power output. This protects the output stage against switch-off spikes. The ESK 106 will be supplied in the tabulated housings with numerous options.

1.2 Application examples

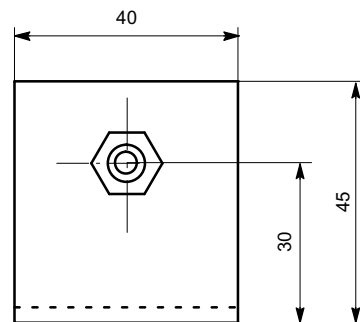
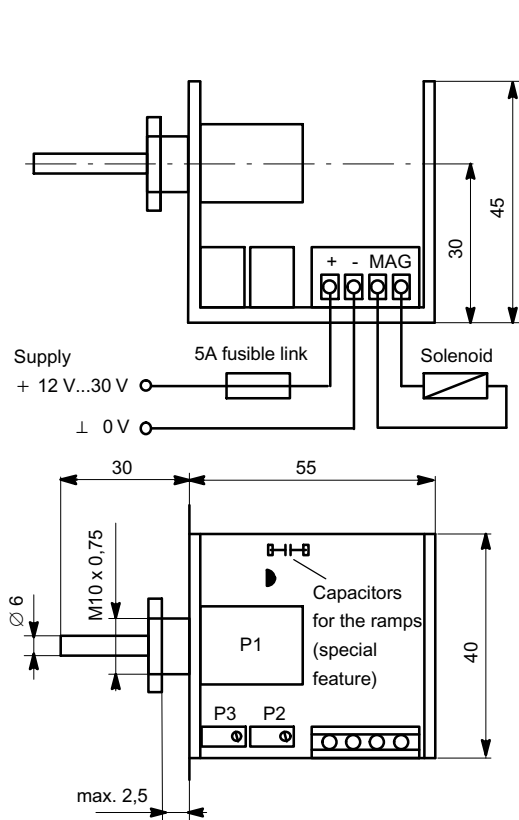
- Agricultural and forestry equipment
 - Fertiliser spreader
 - Dung spreader
 - Fodder mix and cast wagon
- Construction machines
 - Road rollers
 - Ground drilling rigs
- Municipal equipment
 - Snow and ice cleaning equipment
 - Sweeper
- General
 - Speed and pressure control
 - Materials handling
 - Belt and spinner drive
 - Scraper floor drive

1.3 Technical data

Electrical characteristics	Unit	Description, value
Power supply (U_b)	V	12...30 V DC, smoothed. Ripple < 10%
Minimum current (I_{min})	A	from 0,2 1,2
Maximum current (I_{max})	A	$I_{min} + (0,4 \text{ to max. } 2,5 \text{ A})$
Maximum output voltage	V	approx. (supply voltage -3,5) V
Maximum permissible output current (I_{zul})	A	2,5

Electrical characteristics	Unit	Description, value
Dither frequency	Hz	Factory set at 100 (triangular wave from)
Enclosure protection		IP00
Operating temperature	°C	-20 ... +50
Notable features		The power supply input is reverse-polarity protected The amplifier switches off automatically for the duration of excessive coil current (coil short circuit)
Mass		approx. 100 g
Cable length and section		For 1 mm ² section wire, max. cable length is 10 metres
Electromagnetic compatibility		- EN 14982 radiated emission - ISO 11452--2...-5 Immunity radiated electromagnetic energy - ISO/TR 10605 Immunity against discharge static electricity - ISO 7637--0...-2 Immunity against circuit disturbance; class D, A

1.4 Dimensions and connection diagram

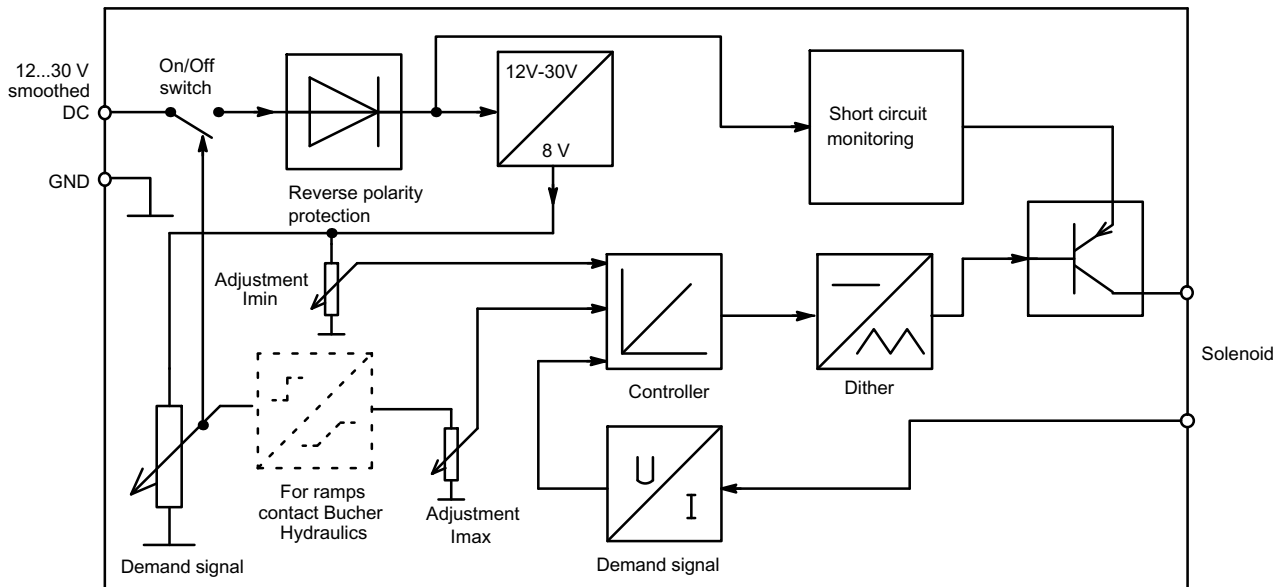


P1 = Potentiometer
If advisable in the installation circumstances, the j 6mm potentiometer spindle can be shortened.

1.4.1 Trim potentiometer

max. 20 turns ✓ + ☒ -
P2 = Minimum current
P2 = Maximum current

1.5 Block diagram



1.6 Ordering code

		E	S	S	K	1	0	6	-	9	1	*	*	*	/	9	9
Electronic products																	
Unit	without front plate		=														
Proportional amplifier			=														
Type			=														
Model	with screw terminals		=														
	with screw terminals; encapsulated model		=														
Power supply	12... 30 V DC		=														
Variants / special feature (insert only if required)			=														
	Standard		=														
	With ramp 1 sec.		=														
	With ramp 2 sec.		=														
	With ramp 4 sec.		=														
	With ramp 5 sec.		=														
	With ramp 20 sec.		=														
	Rotation potentiometer inversed (10 ↷ 0)		=														
	Potentiometer no ON/OFF switch		=														
	Max. current = 10 turns (10 turns = 100%), switch		=														
	Slewing range 50°		=														

1.7 Accessories



Description	Ord. code
Front plate	100218778
Potentiometer indicator knob	100604397
Fine fuse, 5 A, fusible link	100606938
Flying fuse holder	100607349

1.8 Other applicable documents

Document	Purpose
Technical data sheet 100-I-700008	Technical documentation with all relevant descriptions, data characteristic lines and measurements

2 What is possible?

<p>ELSK 106 compact amplifier</p> 	<p>Description</p> <p>Proportional amplifier module; front plate and indicator knob</p>
<p>ELSK 106-01***/11 control box</p> 	<p>Description</p> <p>Makrolon® housing with magnetic clamp, M12 sleeve, rotary potentiometer, indicator knob; LED</p>
<p>ELSK 106-02***/11 control box</p> 	<p>Description</p> <p>Makrolon® housing with magnetic clamp, M12 sleeve, rotary potentiometer, indicator knob, ON/OFF-switch, LED</p>
<p>ELSK 106-09*** control box</p> 	<p>Description</p> <p>Aluminium housing shock resistant with 2 potentiometers, 3 toggle switches, 1 LED and a socket STAF 14</p>
<p>ELSK 106-10*** control box</p> 	<p>Description</p> <p>Robust aluminium housing with 2 potentiometers, 3 toggle switches, 1 LED and a socket STAF 14</p>
<p>ELSK 106-14*** control box</p> 	<p>Description</p> <p>Robust aluminium housing with 2 potentiometers, 3 toggle switches, 1 LED, 1 keylock (starter) and a socket STAF 14</p>

<p>ELSK 106-15*** control box</p>	<p>Description</p>
	<p>Robust aluminium housing with 2 potentiometers, 1 On/Off-switch, 3 toggle switches, 3 control LED's, 1 keylock (starter) and a socket STAF 14</p>
<p>ELSK 106-16*** control box</p>	<p>Description</p>
	<p>Robust aluminium housing with 3 potentiometers, green control-LED, On/Off-switch, 4 toggle switches for work light, spread symmetry, warning beacon and connector insert, and a socket STAF 14</p>

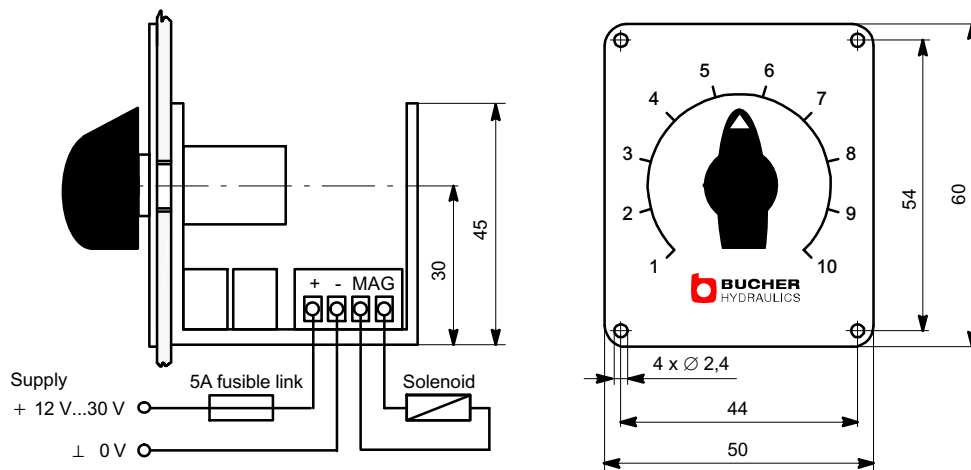
3 ELSK 106 compact amplifier



3.1 Description

Options and applications are like ESSK 106, but with additional front plate and potentiometer indicator knob.

3.2 Dimensions and connection diagram



3.3 Ordering code

Description	Type	Ordering code
Controller with screw terminals	ELSK106-91***	100018790
Controller with screw terminals; potted	ELSK106-81***	100018791
Controller with screw terminals; potted; with ramp, 4 sec	ELSK106-81***/04	100026079
Controller with screw terminals; potted; with ramp, 2 sec	ELSK106-81***/02	100013454

3.4 Accessories

Description	Ord. code
Fine fuse, 5 A, fusible link	100606938
Flying fuse holder	100607349

4 ELSK 106-01***/11 control box



4.1 Description

The ELSK 106-01***/11 unit is used to control a proportional solenoid. The proportional solenoid is controlled by an integrated module ESK 106-91***. The Makrolon® housing provides a front plate, with an on/off switch, a green LED and a potentiometer with indicator knob. The potentiometer

provides an indicator knob with ON/OFF switch in zero position. The output current varies linearly with the rotating angle of the potentiometer. The green LED lights as soon as the ON/OFF switch is turned on. Minimum and maximum current level are adjustable.

4.2 Application examples

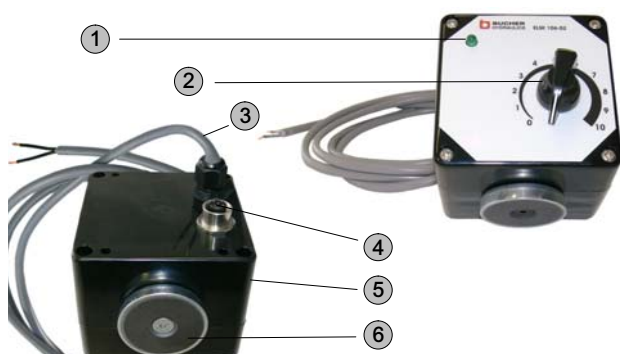
- Agricultural and forestry equipment
 - Fertiliser spreader
 - Dung spreader
 - Fodder mix and cast wagon
- General
 - Belt and disc drive
 - Scraper floor drive

4.3 Technical data

General technical data see section 1.3

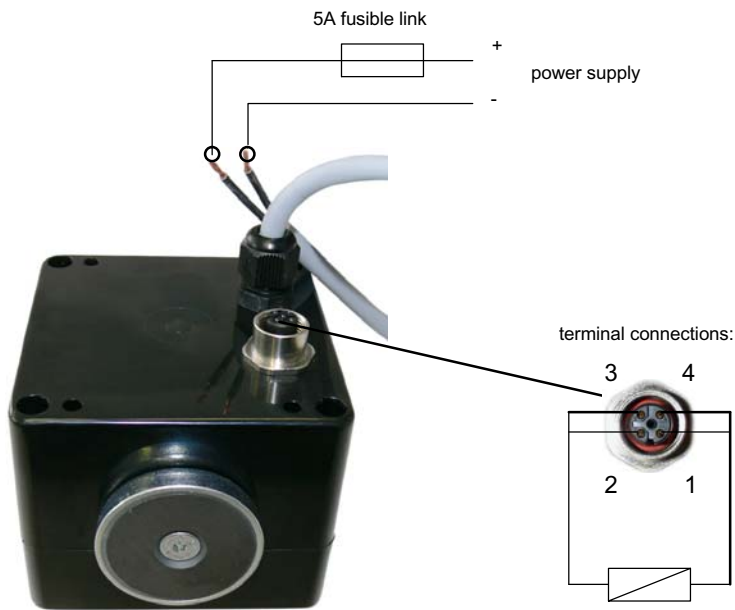
Electrical characteristics	Unit	Description, value
Dimensions		82 x 80 x 65 (L x W x H)
Enclosure protection		IP53

4.4 Functional description



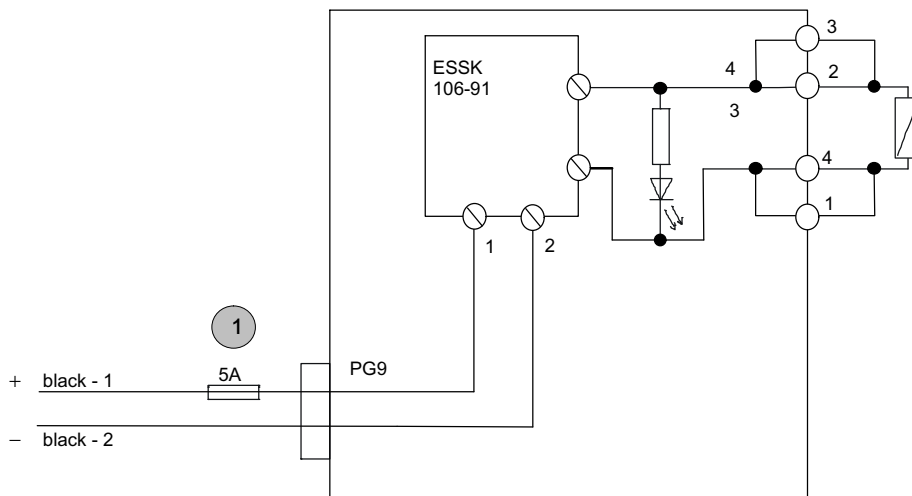
1	Control unit LED, input current
2	Rotary potentiometer with ON/OFF switch
3	Power supply connection cable 1,5m, 2 x 1,5 mm ² , free cable ends
4	Output solenoid (4-pin M12 sleeve)
5	Makrolon® housing: 82 x 80 x 65
6	Magnetic clamp

4.5 Connection diagram



On the 4 pin connector the solenoid loads must be connected using both pins.

4.6 Block diagram



1 Accessories (Fine fuse, 5 A) see par. 4.8

4.7 Ordering code

Description	Type	Ordering code
Controller	ELSK 106-01***/11	100026578

4.8 Accessories

Description	Ord. code
Extension cable 1 m with M12 sleeve and plug	100152509
Cable 5 m, with plug M12 and free cable ends	100152582
Coil connecting lead 2 x 1 mm ² (state required length in metres)	100604380
Coil connector plug GDM 309	100064970
Coil connector plug GDM 209D with diode	100014130
Fine fuse, 5A, fusible link	100606938
Flying fuse holder	100607349
Coil connecting cable 5 m, with M12 plug and GDM plug	100153211
Coil connecting cable 8m, with M12 plug and GDM309 plug	100153213

5 ELSK 106-02***/11 control box



5.1 Description

Options and applications are like 106-01***/11, but with additional ON/OFF switch.

5.2 Application examples

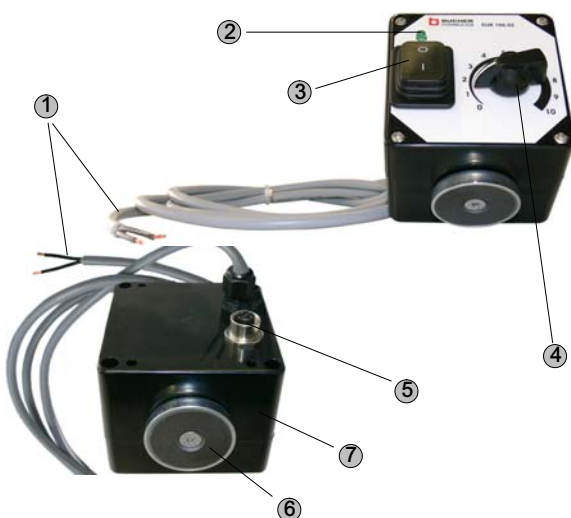
- Agricultural and forestry equipment
 - Fertiliser spreader
 - Dung spreader
 - Fodder mix and cast wagon
- General
 - Belt and disc drive
 - Scraper floor drive

5.3 Technical data

General technical data see section 1.3

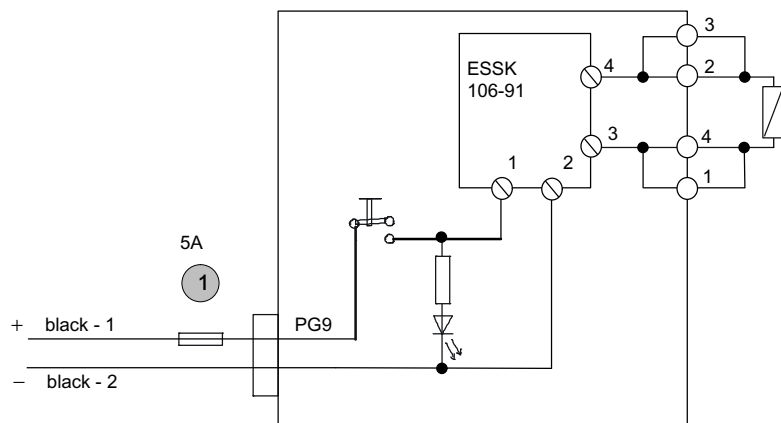
Electrical characteristics	Unit	Description, value
Dimensions		82 x 80 x 65 (L x W x H)
Enclosure protection		IP53

5.4 Functional description



1	Power supply connection cable 1,5m, 2 x 1,5 mm ² , free cable ends
2	Control unit LED, input current
3	ON/OFF switch
4	Rotary potentiometer no ON/OFF switch
5	Output solenoid (4-pin M12 sleeve)
6	Magnetic clamp
7	Makrolon® housing: 82 x 80 x 65

5.5 Block diagram



1 Accessories (Fine fuse, 5 A), see par. 5.7

5.6 Ordering code

Description	Type	Ordering code
Controller	ELSK106-02***/11	100026579

5.7 Accessories

Description	Ord. code
Fine fuse 5 A, fusible link	100606938
Flying fuse holder	100607349

6 ELSK 106-09*** control box



6.1 Description

The ELSK 106-106-09*** unit is used to control 2 x 2 proportional solenoids reversal. The robust aluminium housing provides two proportional amplifier modules. The poten-

tiometer provides an indicator knob and one ON/OFF switch in zero position. The green LED lights as soon as the ON/OFF switch is turned on.

6.2 Application examples

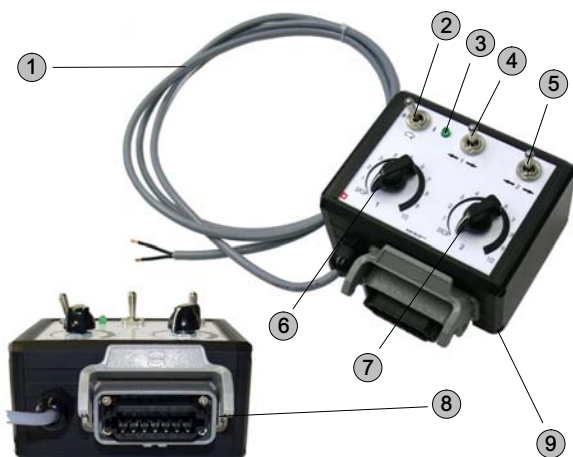
- Agricultural and forestry equipment
 - Fertiliser spreader
 - Dung spreader
 - Fodder mix and cast wagon
 - Crushing plants
- General
 - Belt drive
 - Scraper floor drive

6.3 Technical data

General technical data see section 1.3

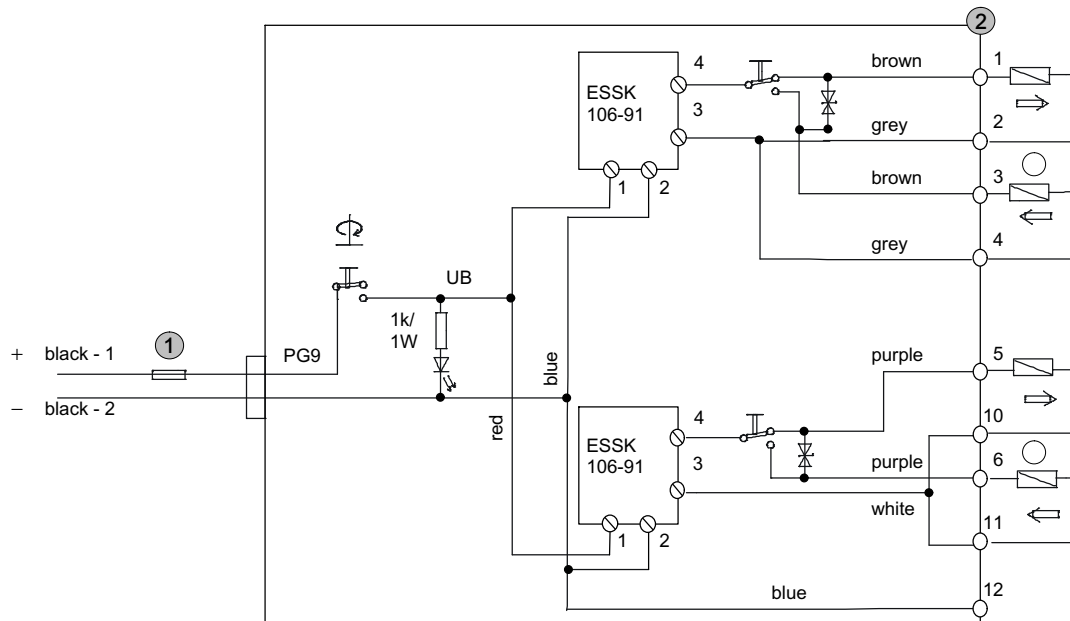
Electrical characteristics	Unit	Description, value
Dimensions		134 x 106 x 70 (L x W x H)
Enclosure protection		IP53

6.4 Functional description



1	Power supply connection cable 1,5m, 2 x 1,5 mm ² , free cable ends
2	Power supply ON/OFF switch
3	Input current control unit LED
4	Switch for reversal of direction for actuator 1 (ON/OFF/ON)
5	Switch for reversal of direction for actuator 2 (ON/OFF/ON)
6	Potentiometer for solenoid 1 with indicator knob and ON/OFF switch
7	Potentiometer for solenoid 2 with indicator knob and ON/OFF switch
8	14-pin plug insert STAF 14 (Harting)
9	Robust aluminium housing, dimensions: 134 x 106 x 70 (L x W x H)

6.5 Block diagram



1	Accessories see chapter 6.7
2	Pin 7, 8, 9, 13 and 14 are not in use

6.6 Ordering code

Description	Type	Ordering code
Controller	ELSK106-09***/10	100032789

6.7 Accessories

Description	Ord. code
Plug insert STAF 14 (Harting)	100609977
Line housing STAF 14	100609980
Fine fuse, 10 A, fusible link	100606306
Flying fuse holder	100607349

7 ELSK 106-10*** control box



7.1 Description

The ELSK 106-10*** compact amplifier is used to control two proportional solenoids. There are two ESSK 106 modules integrated into the robust aluminium housing. The potentiometer provides an indicator knob and one ON/OFF

switch in zero position. 2 further ON/OFF switches for a warning beacon and an auxiliary light. The green LED lights as soon as the ON/OFF switch is turned on.

7.2 Application examples

- Agricultural and forestry equipment
 - Fertiliser spreader
 - Dung spreader
 - Fodder mix and cast wagon
 - Crushing plants
- General
 - Belt drive
 - Scraper floor drive
- Winter road management

7.3 Technical data

General technical data see section 1.3

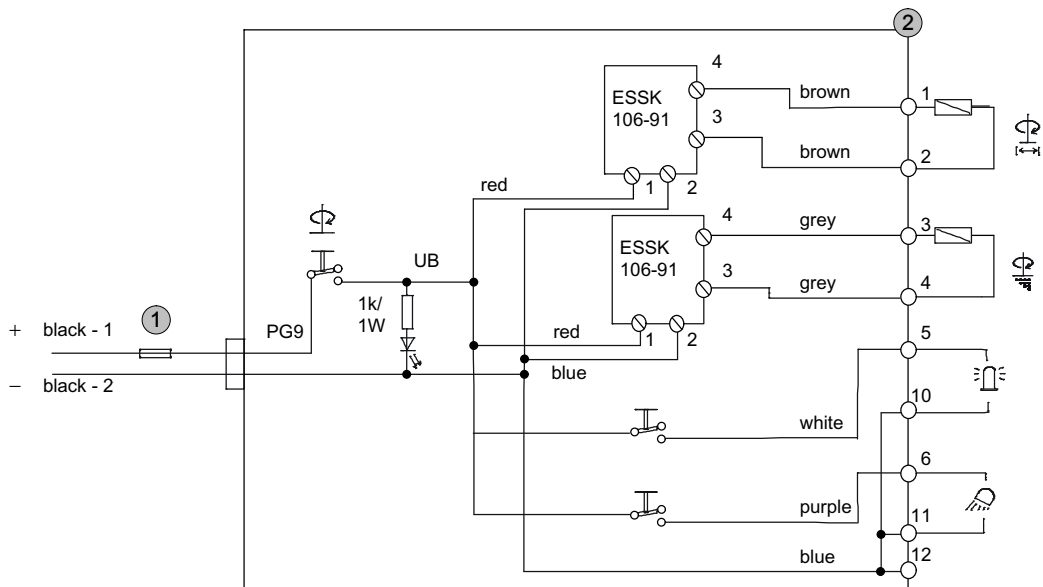
Electrical characteristics	Unit	Description, value
Dimensions		134 x 106 x 70 (L x W x H)
Enclosure protection		IP53

7.4 Functional description



1	Power supply connection cable 1,5m, 2 x 1,5 mm ² , free cable ends
2	Power supply ON/OFF switch
3	Input current control unit LED
4	ON/OFF switch, for example warning beacons
5	ON/OFF switch, for example auxiliary lights
6	Potentiometer for solenoid 1 (for example spreading width) with indicator knob and ON/OFF switch
7	Potentiometer for solenoid 2 (for example spreading density) with indicator knob and ON/OFF switch
8	14-pin socket STAF 14 (Harting)
9	Robust aluminium housing, dimensions: 134 x 106 x 70 (L x W x H)

7.5 Block diagram



1	Accessories see chapter 7.7
2	Pin 7, 8, 9, 13 and 14 are not in use

7.6 Ordering code

Description	Type	Ordering code
Controller	ELSK106-10***/10	100032531

7.7 Accessories

Description	Ord. code
Plug insert STAF 14 (Harting)	100609977
Line housing STAF 14	100609980
Fine fuse, 10 A, fusible link	100606306
Flying fuse holder	100607349
Wiring loom 10 m (see chapter 11.1)	100153227
Wiring loom 5 m (see chapter 11.1)	100153239

8 ELSK 106-14*** control box



8.1 Description

The ELSK 106-14*** unit is used to control 2 proportional solenoids. There are two ESSK 106 modules integrated into a robust aluminium housing. The potentiometers provide an indicator knob and one ON/OFF switch in zero position. The green LED lights as soon as the ON/OFF main switch is turned on. Built in Keylock (starter) to be connected on site. 2 further ON/OFF switches for a warning beacon and an auxiliary light.

8.2 Application examples

- Municipal equipment
 - Snow and ice cleaning equipment
 - Sweeper
- General
 - Disc drive
 - Spreading drives
 - Brush drives

8.3 Technical data

General technical data see section 1.3

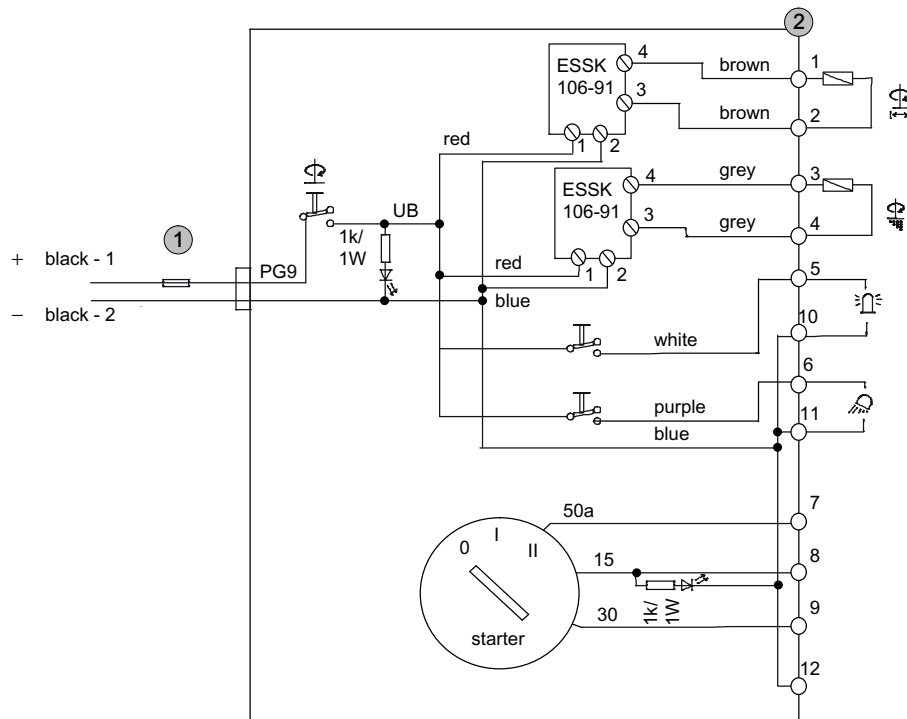
Electrical characteristics	Unit	Description, value
Dimensions		184 x 106 x 70 (L x W x H)
Enclosure protection		IP53

8.4 Functional description



1	Power supply connection cable 1,5m, 2 x 1,5 mm ² , free cable ends
2	Power supply ON/OFF switch
3	Input current control unit LED
4	ON/OFF switch, for example warning beacons
5	ON/OFF switch, for example auxiliary lights
6	Keylock (starter) to be connected on site.
7	Potentiometer for solenoid 1 (for example spreading width) with indicator knob and ON/OFF switch
8	Potentiometer for solenoid 2 (for example spreading density) with indicator knob and ON/OFF switch
9	14-pin socket STAF 14 (Harting)
10	Robust aluminium housing, dimensions: 184 x 106 x 70 (L x W x H)

8.5 Block diagram



1 Accessories see chapter 8.7

2 Pin 13 and 14 are not in use

8.6 Ordering code

Description	Type	Ordering code
Controller	ELSK106-14***/10	100032159

8.7 Accessories

Description	Ord. code
Plug insert STAF 14 (Harting)	100609977
Line housing STAF 14	100609980
Fine fuse, 10 A, fusible link	100606306
Flying fuse holder	100607349
Wiring loom 10 m (see chapter 11.1)	100153227
Wiring loom 5 m (see chapter 11.1)	100153239

9 ELSK106-15*** control box



9.1 Description

The ELSK 106-15*** unit is used to control a proportional solenoid. It consists of the ESSK 106--91*** module, fitted in a Macrolon housing. The housing is provided with a front plate with an on/off switch, a green LED and a control signal potentiometer with indicator knob.

The output current varies linearly with the angle of rotation of the control signal potentiometer. The green LED lights as soon as the unit is switched on.

9.2 Application examples

- Municipal equipment
 - Snow and ice cleaning equipment
 - Sweeper
- General
 - Disc drive
 - Spreading drives
 - Brush drives

9.3 Technical data

General technical data see section 1.3

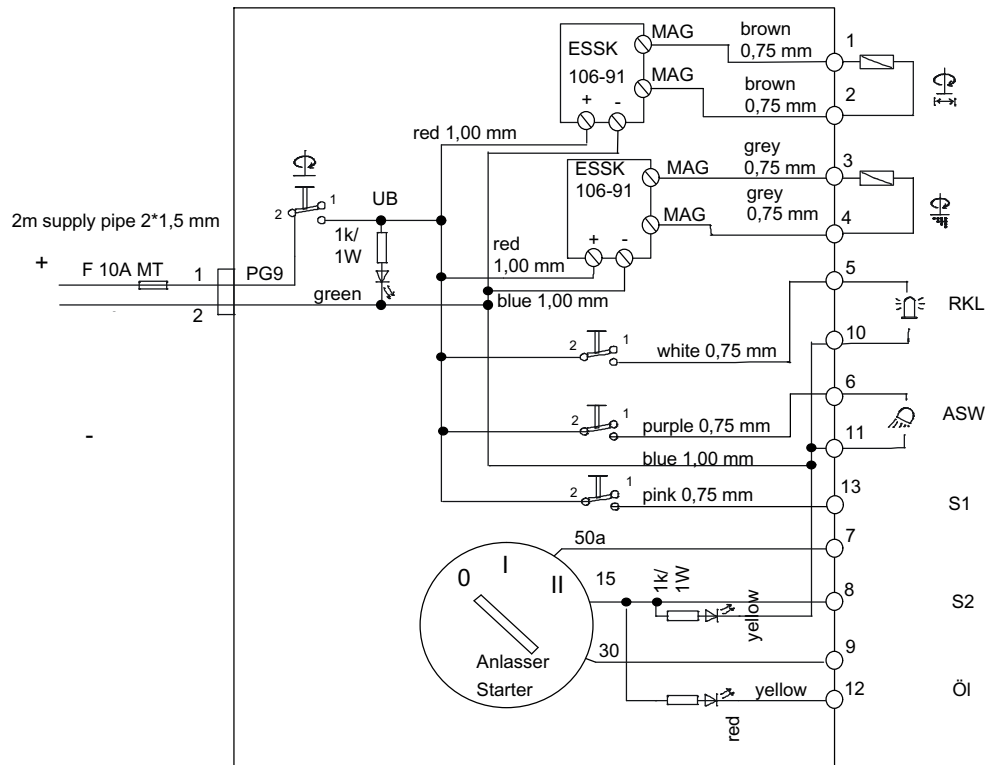
Electrical characteristics	Unit	Description, value
Dimensions		184 x 106 x 70 (L x W x H)
Enclosure protection		IP53

9.4 Functional description



1	Power supply connection cable 1,5m, 2 x 1,5 mm ² , free cable ends
2	Power supply ON/OFF switch
3	Input current control unit LED
4	ON/OFF switch, for example warning beacons
5	ON/OFF switch, for example auxiliary lights
6	Control LED for battery
7	Control-LED for oil
8	Keylock (starter) to be connected on site.
9	Potentiometer for solenoid 1 (for example spreading width) with indicator knob and ON/OFF switch
10	Potentiometer for solenoid 2 (for example spreading density) with indicator knob and ON/OFF switch
11	ON/OFF switch
12	14-pin socket STAF 14 (Harting)
13	Robust aluminium housing, dimensions: 184 x 106 x 70 (L x W x H)

9.5 Block diagram



1	Accessories see chapter 9.7
2	Pin 14 is not in use

9.6 Ordering code

Description	Type	Ordering code
Controller	ELSK106-15***/10	100034145

9.7 Accessories

Description	Ord. code
Plug insert STAF 14 (Harting)	100609977
Line housing STAF 14	100609980
Fine fuse, 10 A, fusible link	100606306
Flying fuse holder	100607349
Wiring loom 5 m (see chapter 11.2)	100153239

9.8 Spare part

Description	Ord. code
ON/OFF-Switch	100607681

10 ELSK 106-16*** control box



10.1 Description

The ELSK 106-16*** unit is used to control three proportional solenoids. It consists of the ESK 106-91*** module, fitted in a Macrolon housing. The housing is provided with a front plate with an on/off switch, a green LED and a control signal potentiometer with indicator knob.

The output current varies linearly with the angle of rotation of the control signal potentiometer. The green LED lights as soon as the unit is switched on.

10.2 Application examples

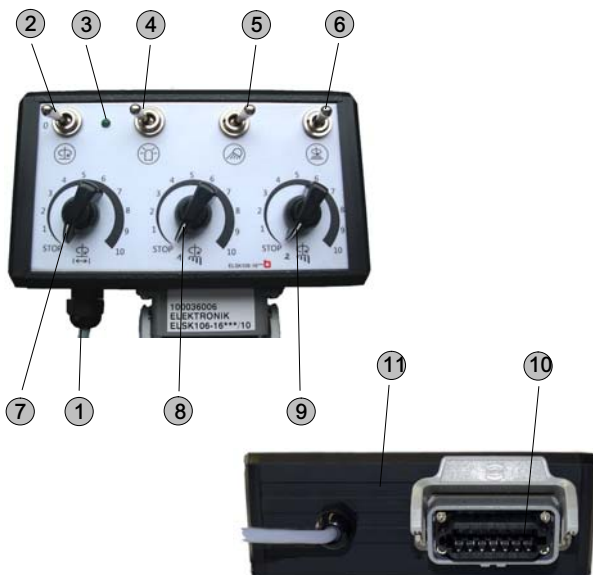
- Agricultural and forestry equipment
 - Fertiliser spreader
 - Dung spreader
 - Fodder mix and cast wagon
 - Crushing plants
- General
 - Belt drive
 - Scraper floor drive

10.3 Technical data

General technical data see section 1.3

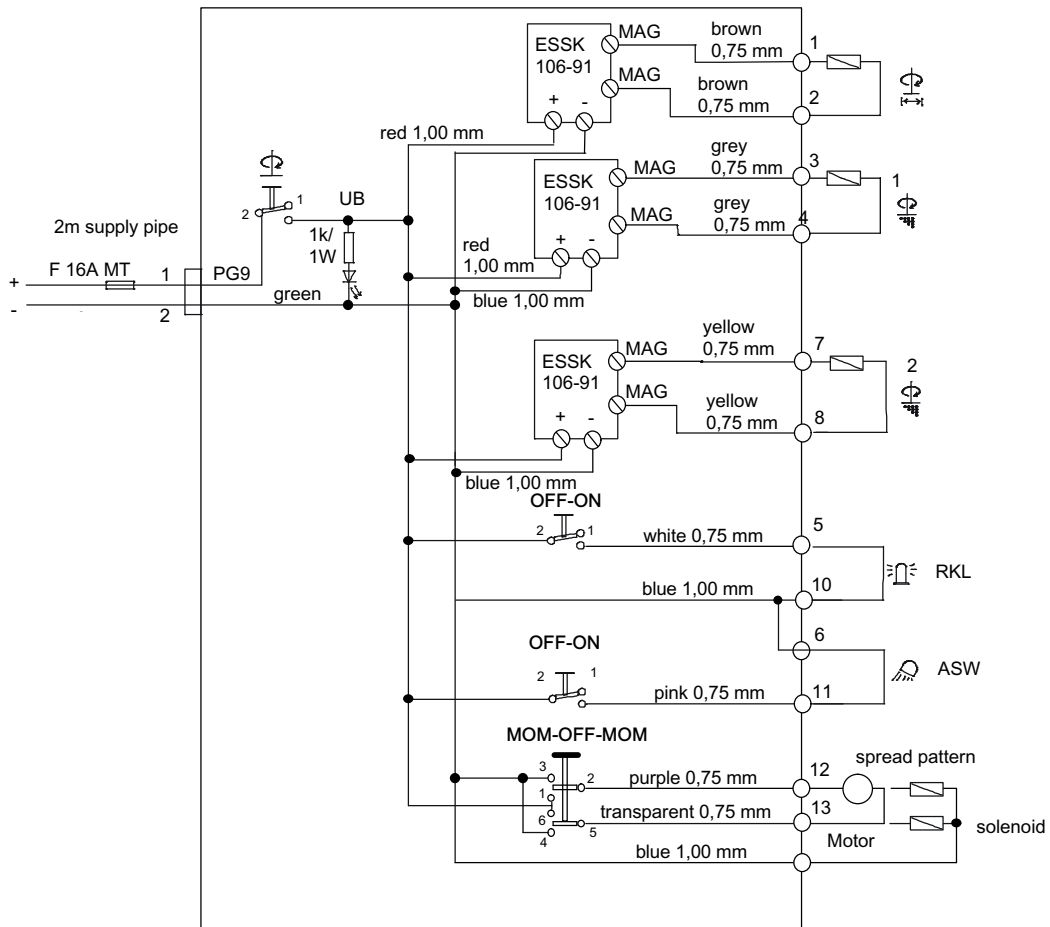
Electrical characteristics	Unit	Description, value
Dimensions		184 x 106 x 70 (L x W x H)
Enclosure protection		IP53

10.4 Functional description



1	Power supply connection cable 2m, 2 x 1,5 mm ² , free cable ends
2	ON/OFF-switch
3	Input current control unit LED
4	ON/OFF switch, for example warning beacons
5	ON/OFF switch, for example auxiliary lights
6	ON/OFF switch for control the spreading density
7	Potentiometer for solenoid 1 (for example spreading width) with indicator knob and ON/OFF switch
8	Potentiometer for solenoid 2 (for example spreading density) with indicator knob and ON/OFF switch
9	Potentiometer for solenoid 2 (for example spreading density) with indicator knob and ON/OFF switch
10	14-pin socket STAF 14 (Harting)
11	Robust aluminium housing, dimensions: 184 x 106 x 70 (L x W x H)

10.5 Block diagram



1 Accessories see chapter 10.7

10.6 Ordering code

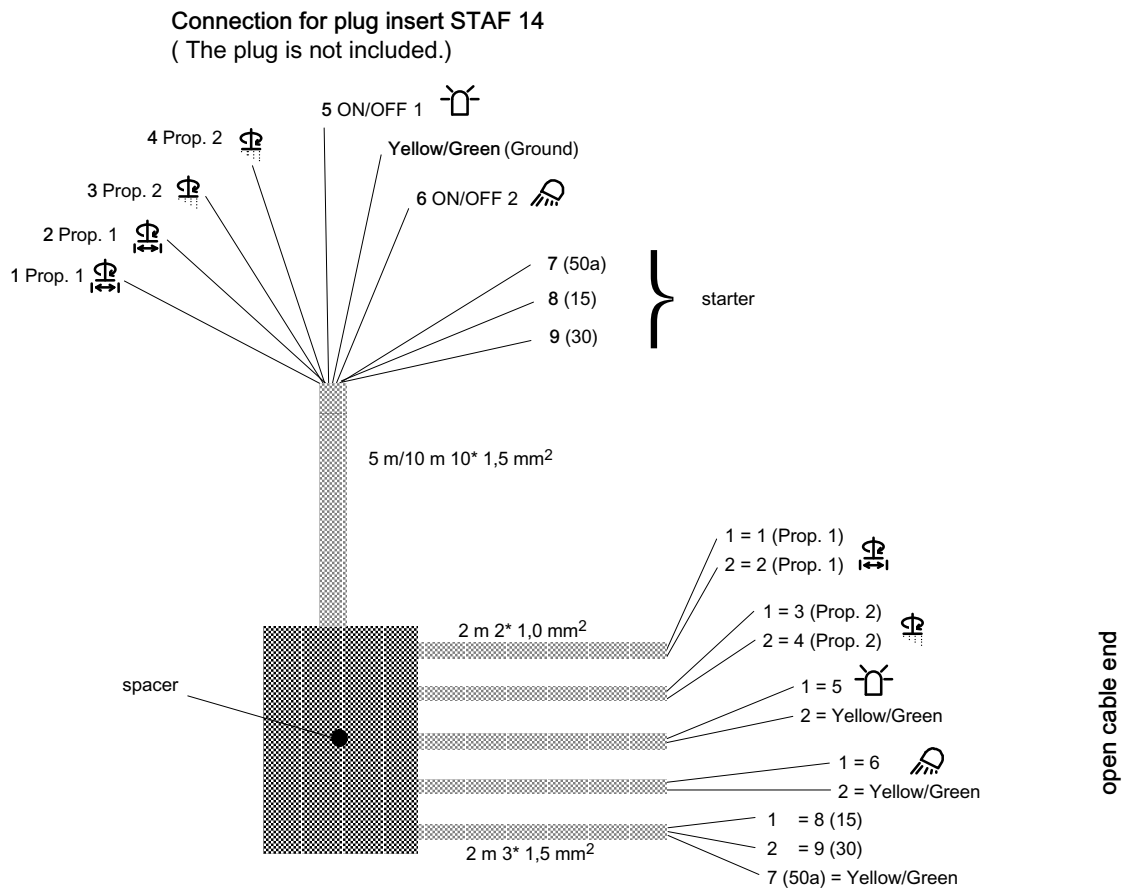
Description	Type	Ordering code
Controller	ELSK106-16***/10	100036006

10.7 Accessories

Description	Ord. code
Plug insert STAF 14 (Harting)	100609977
Line housing STAF 14	100609980
Fine fuse, 10 A, fusible link	100606306
Flying fuse holder	100607349

11 Wiring loom

11.1 Wiring loom EKAB100-



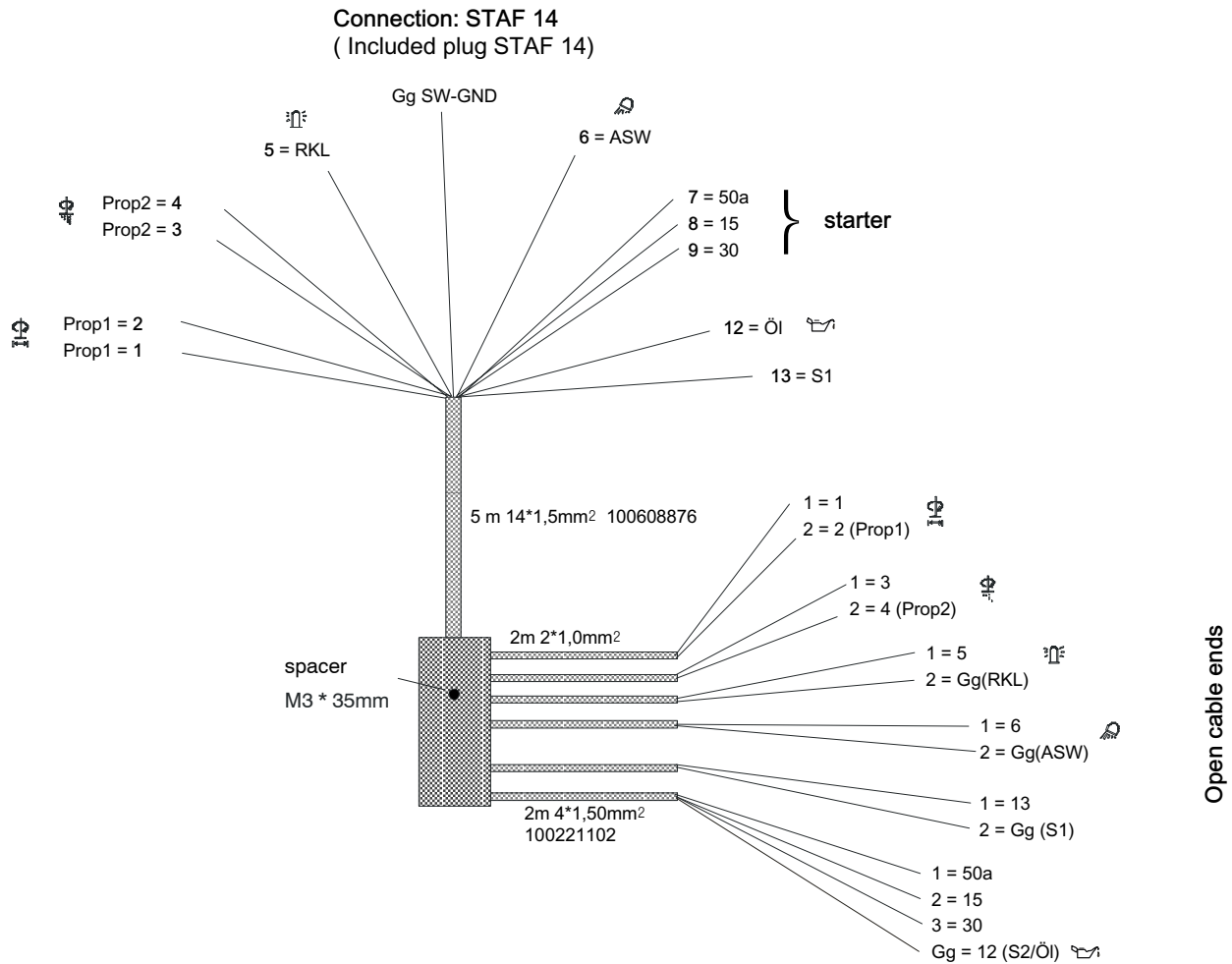
11.1.1 Ordering code

Description	Type	Ordering code
Wiring loom 5 m (5 meter 10x1 mm)	Wiring loom EKAB100-05	100153239
Wiring loom 10 m (10 meter 10x1 mm)	Wiring loom EKAB100-10	100153227

11.1.2 Spare parts

Description	Ord. code
Plug insert STAF 14 (Harting)	100609977
Line housing STAF 14	100609980
Cable connection PG16	100601546

11.2 Wiring loom EKAB101-



11.2.1 Ordering code

Description	Type	Ordering code
Wiring loom 5 m (5 meter 14x1,5 mm ²)	Wiring loom EKAB101-05	100153969

11.2.2 Spare parts

Description	Ord. code
Plug insert STAF 14 (Harting)	100609977
Line housing STAF 14	100609980
Cable connection PG16	100601546

info.kl@bucherhydraulics.com

www.bucherhydraulics.com

© 2015 by Bucher Hydraulics GmbH, D-79771 Klettgau

All rights reserved.

Data is provided for the purpose of product description only, and must not be construed as warranted characteristics in the legal sense. The information does not relieve users from the duty of conducting their own evaluations and tests. Because the products are subject to continual improvement, we reserve the right to amend the product specifications contained in this catalogue.

Classification: 470.710.