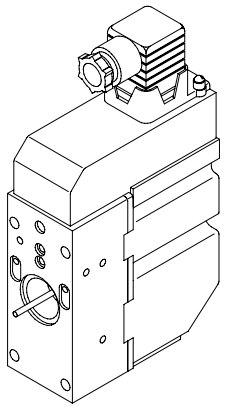
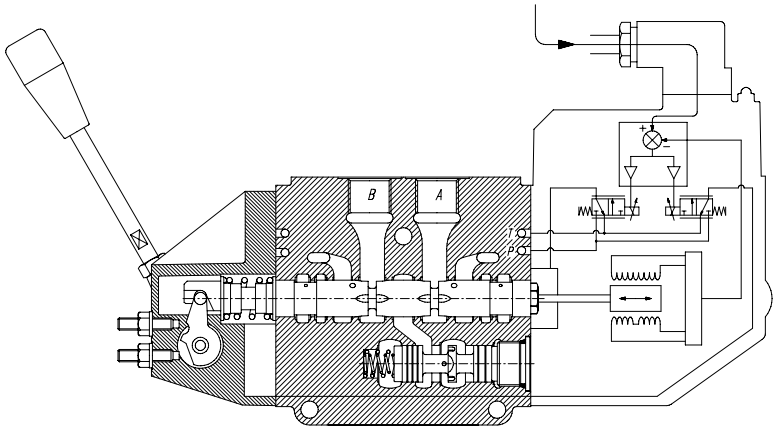




MHPE–D PROPORTIONAL ACTIVATION MODULE

Brevini Hydraulics is introducing a new MHPE–D closed loop electrohydraulic activation unit, whose design is based on digital technology.
Designed with the future in mind, MHPE–D can handle much larger amounts of information than the older analogue one and has been specially developed to meet the harsh operating requirements of today's mobile machine market.

MHPE–D electrical closed loop proportional actuation operates safely and precisely the main spool's shift according to an electrical signal coming from a remote control unit, and is recommended where precise metering control, low hysteresis, fault monitoring, and fast system reaction are paramount.

The input signal, by means of the PCB and the two reducing proportional solenoid valves, is converted into a low pilot pressure which in turn moves the HPV's spool.
The inductive transducer position (LVDT) ensures that the spool is being moved in the correct position, otherwise, in the event of uncontrolled spool positioning, the feed–back signal will detect it as an error and it will fast react operator independent (fault monitoring system, see diagrams in the following pages).

MHPE–D is defined by :

- capacity to handle three different kinds of input signal control. The required signal control is to be stated in the order phase, and is to be carried out at the factory, but it can be easily changed via a PROGRAMMING CONTROL PANEL provided by Brevini Hydraulics;
- inductive transducer position, LVDT (Linear Variable Differential Transformer);
- integrated PWM (Pulse Width Modulation);
- fault monitoring, transistor output for signal source;
- excellent regulation;
- low hysteresis;
- short reaction time.

TECHNICAL DATA

Rated voltage			12 V_{DC}	24 V_{DC}
Supply voltage		range	11 to 15 V	20 to 28 V
		max. ripple	5 %	
A*	Input signal control	neutral position	0.5 x U_{DC}	
		control range	0.25 x U_{DC} to 0.75 x U_{DC}	
	Max. current signal control		0.5 mA	1 mA
	Input impedance in relation 0.5 x U_{DC}		12 kΩ	
B*	Input signal control	0 – 10 V_{DC}		
		neutral position	5 V_{DC}	
		control range	0.25 x 10 V_{DC} to 0.75 x 10 V_{DC}	
	Current signal control		0.5 mA	
	Input impedance in relation 0 – 10 V_{DC}		20 kΩ	
C*	Input signal control	4 – 20 mA		
		neutral position	10 mA	
		control range	0.25 x 20 mA to 0.75 x 20 mA	
	Input impedance in relation 4 – 20 mA		0.5 kΩ	
Current supply			520 mA	260 mA
Current consumption (neutral position, constant voltage)			36 mA	46 mA
Power consumption			6 W	
Fault monitoring		max. current on safety output (pin no. 3)	50 mA	
		reaction time at fault	550 ms	
Max. current output signal for indication actuating direction (MHPEP–D)			50 mA	
Reaction time (constant voltage)		from neutral position to max. spool travel	min. 110 ms – max. 140 ms	
		from max. spool travel to neutral position	min. 70 ms – max. 90 ms	
Reaction time (neutral switch)		from neutral position to max. spool travel	min. 130 ms – max. 170 ms	
		from max. spool travel to neutral position	min. 70 ms – max. 90 ms	
Grade of enclosure (IEC 529)			IP 65	

A* , B* , C* = SEE THE CODE No. IN THE FOLLOWING PAGES

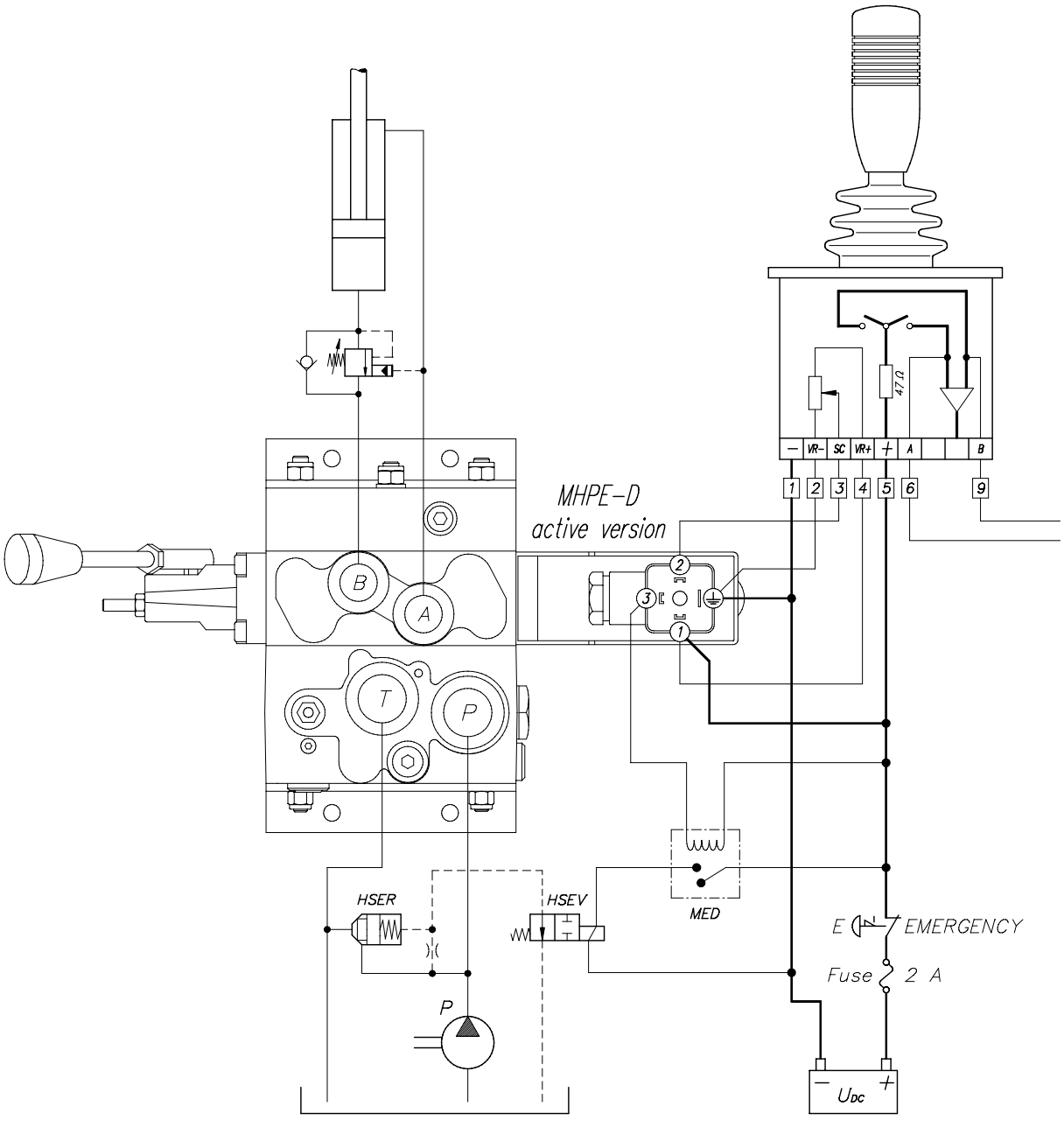
Thanks to the developements in digital electronics, it has been possible to integrate in the MHPE-D modules, besides all the algorithms needed for the spool movement control, also a wide range of advanced circuits above all conceived for the safety and handling of complete systems.

The use of the module in the passive or active versions allows the electrohydraulic systems to be obtained with different safety degrees, for the choice of which, it is essential to know the required functions exactly. Once this condition has been fulfilled, and work is going on in the area stated above, with the four examples described in the following pages, Brevini Hydraulics can always give you the best solution.

HIGHEST SAFETY NEEDS

MHPE-D active version (fault monitoring system)

The system provides the highest safety level against spool positioning failures or electrohydraulic / mechanical malfunctioning (i.g. should spool seizure occur).



DESCRIPTION

When the fault monitoring system is connected and an error state is detected, the system ensures a fast and operator independent reaction that will put the complete hydraulic circuit into venting conditions, thus preventing uncontrollable machine movements.
To get this aim, three others Brevini Hydraulics components are needed:

- *electronic alarm logic module, MED;*
- *electrical activated LS pressure unloading valve module, HSEV;*
- *hydraulic activated pump unloading valve module, HSER.*

As aforementioned, when an error state is detected, an alarm signal is sent out through pin No. 3 of the connector and the MED alarm logic module will cut off current to the HSEV pilot solenoid valve which in turn will make the HSER pump unloading valve in an unbalanced condition, then leading the oil flow direct from pump to tank.
Thus, all functions are with no oil flow and without operating pressure, and the pressure drop on the HPV's inlet section is at the lowest possible level (see HSER typical curve page 16).
When an active error state occurs, the fault monitor logic will be triggered.

In order to prevent the electronics from going into an undefined state, any time the system is being switched on or reset, a general check of the power supply and the internal clock frequency is made.

ACTIVE FAULT MONITORING REACTIONS	*When an error state is detected, the 2 proportional solenoid valves will be automatically switched off, a red lamp will light up, and main spool will go to the centre position (if it is not seized up owing to dirt in the system).* *The system will only react to faults of more than 500 ms duration (in other words, there is a delay of half a second before anything happens).* *An alarm signal is sent out through the connector (pin No. 3) and minus is opened. This state is memorized and will continue as long as the system is being reset by switching off the supply voltage (new start-up).* *If the signal coming from the transducer position (main spool travel) is beyond 15% of the input signal voltage* *The input signal control is continuously monitored and a range between 15% and 85% of supply voltage is allowed. Outside this range, the solenoid valves will be deactivated (spool goes to neutral position) and a warning signal is sent out.* *If the module's pilot pressure curve is not correct according to the input signal voltage,* *If the supply voltage is exceeded by 50% (18 V for 12 V_{DC} and 36 V for 24 V_{DC}) or falls below 8 V* *MHPE-D with fault monitoring system does not work when the supply voltage is cut off. So it means that the system is to be supplied also when the main spool is held in the centre position.*

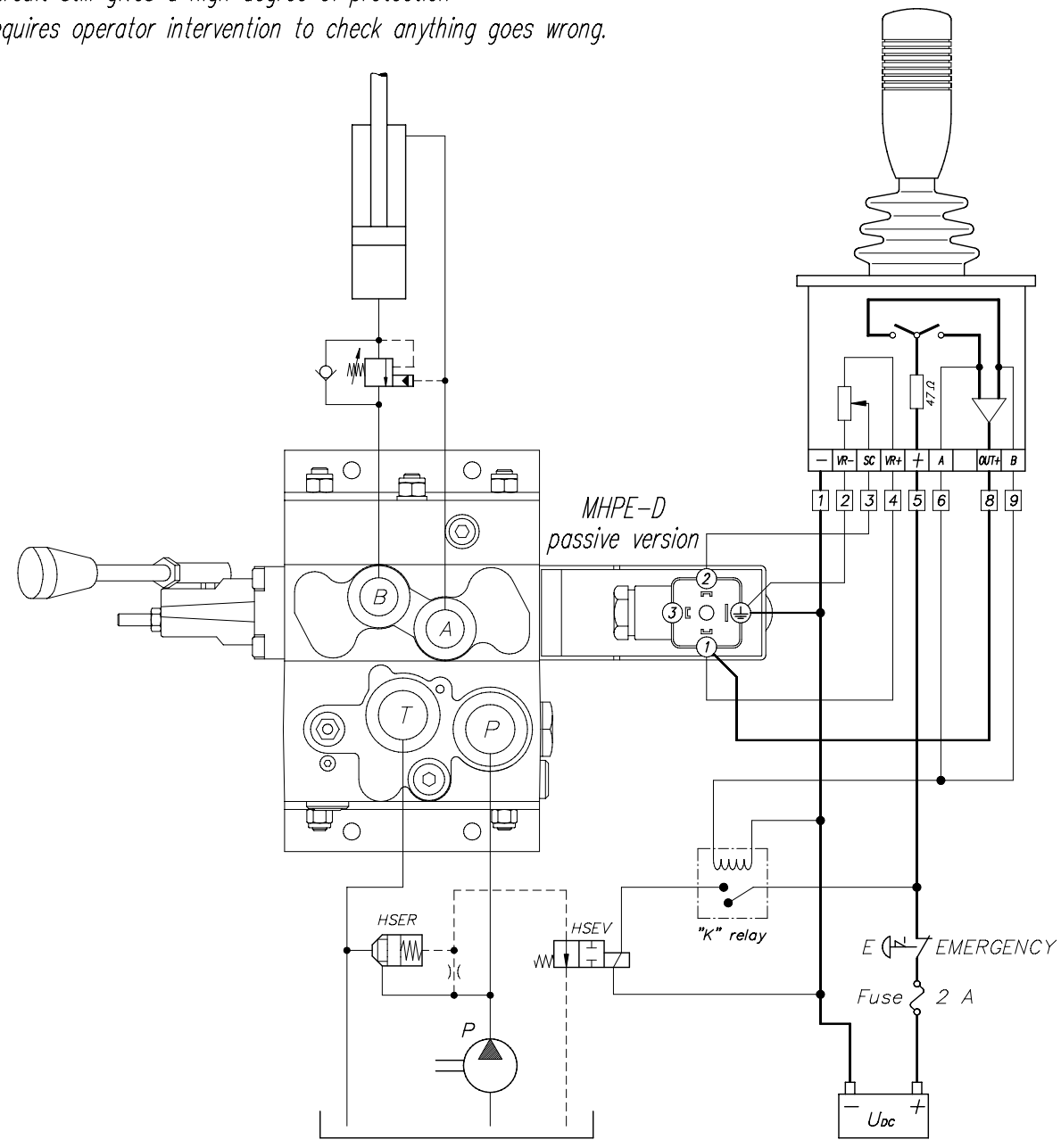
RAISED SAFETY NEEDS

MHPE–D passive version (no fault monitoring system)

The following figure highlights the difference in use between the MHPE–D module passive version and the active one previously described.
The difference lies in the fact that the safety output (pin No. 3) is unconnected, as the module does not have the fault monitoring system function, furthermore it is kept SWITCHED OFF by means of the remote control neutral position switch.
Whenever the latter is used, the MHPE–D module is SWITCHED ON by the OUT+ signal (pin No. 8).
In turn, the A / B direction movement signals (pin No. 6–9) of the remote control activates the relay in position "K", which in turn SWITCHES ON the HSEV pilot solenoid valve, which then TURNS ON the HSER hydraulic activated pump unloading valve, setting up the hydraulic system.

Brevini Hydraulics recommends that both the neutral position switch and direction movement output signal always be connected to the electrical system.

This circuit still gives a high degree of protection but requires operator intervention to check anything goes wrong.

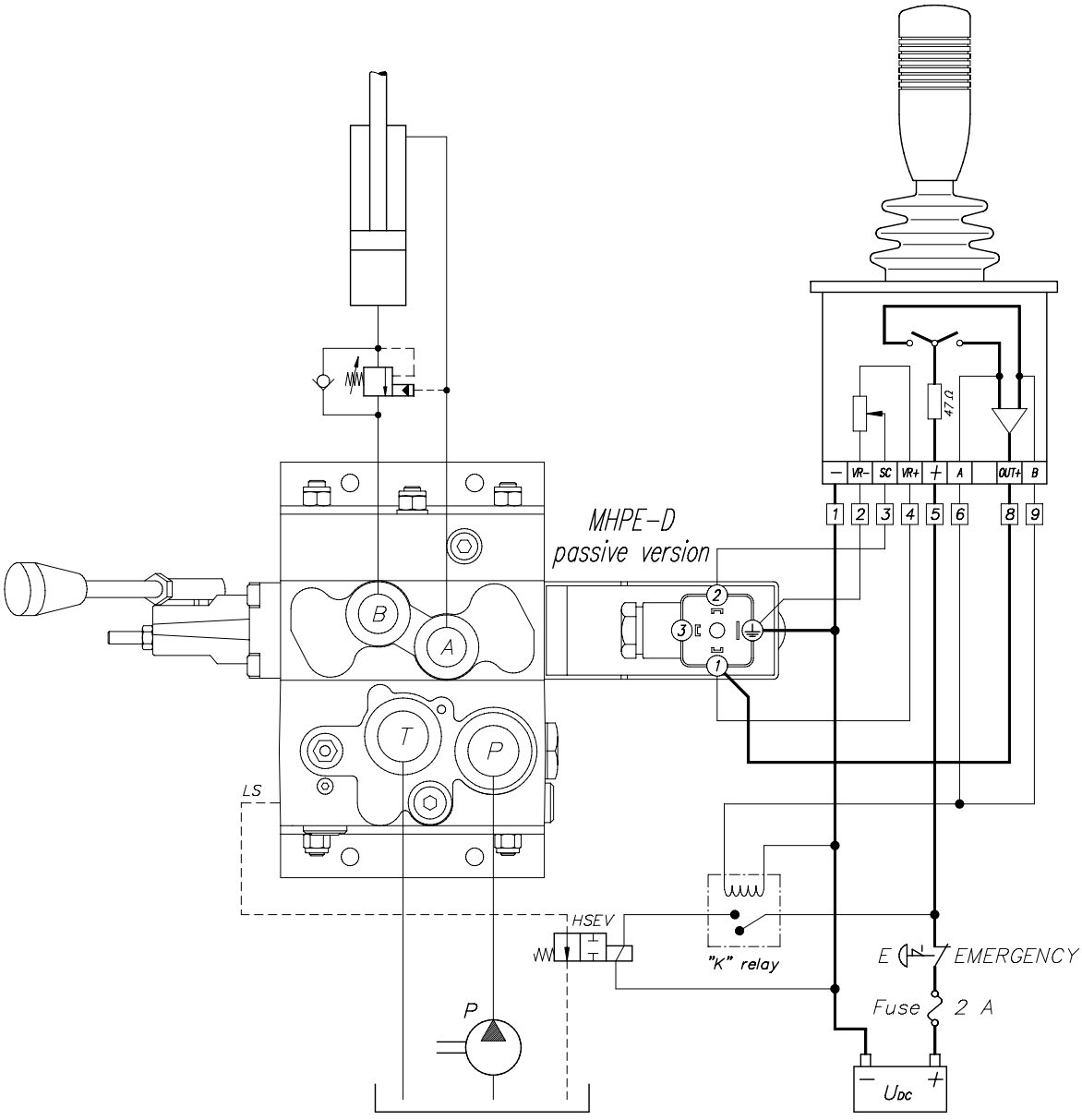


NORMAL SAFETY NEEDS

MHPE-D passive version

Also with this solution, both the MHPE-D module and the relay in position "K" are kept SWITCHED OFF by means of the remote control neutral position switch.
With this figure, the HSEV electrical activated LS pressure unloading valve leads the LS signal direct to the tank.
With this method (HSEV DEACTIVATED), in systems with fixed displacement pumps, the ΔP of the pump unloading oil flow, is almost always between 8 – 15 bar (system dependent)
while in the systems with LS variable displacement pumps,
the remaining pressure depends on the pump stand-by pressure settings.

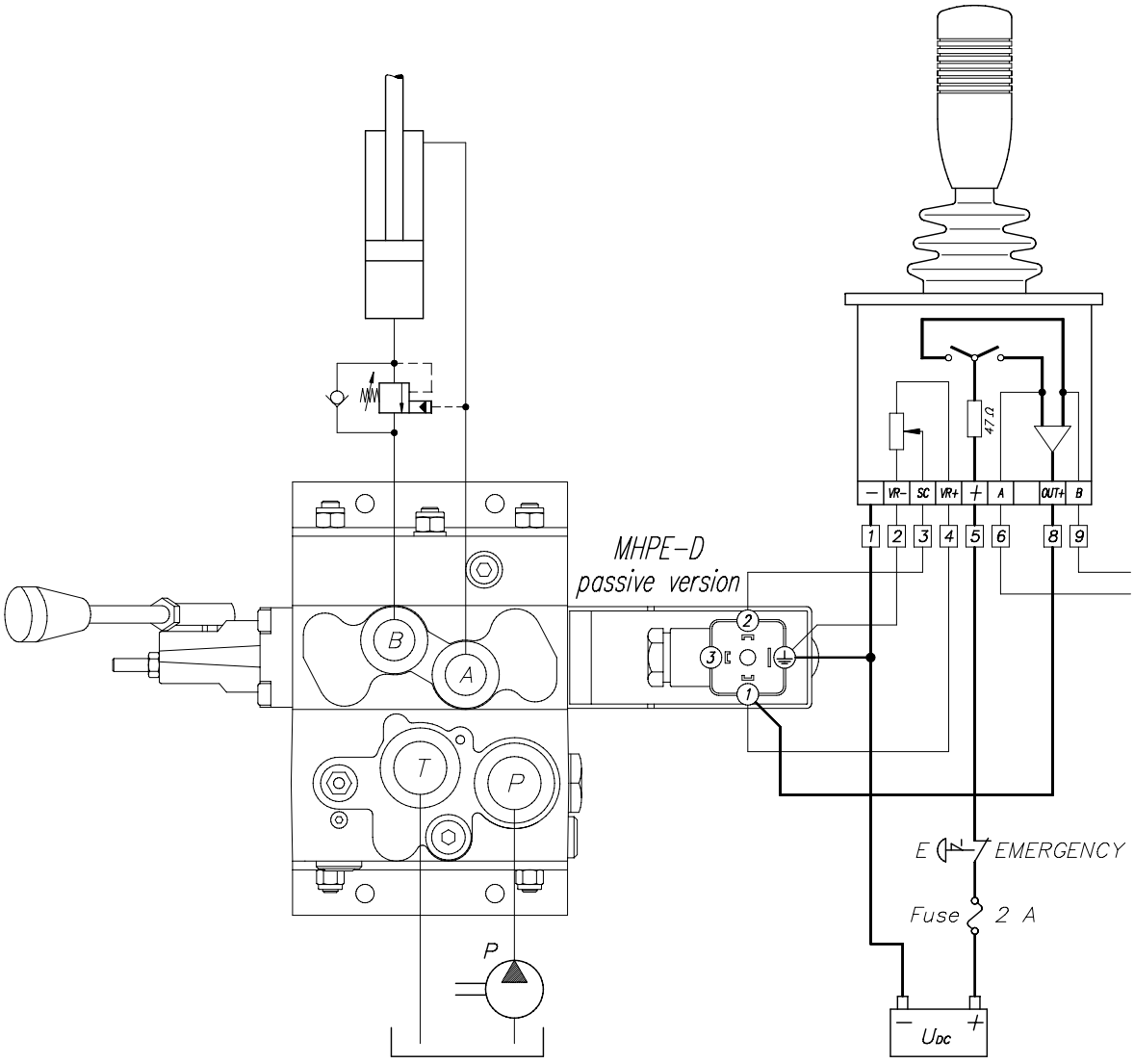
Brevini Hydraulics urge grate care in this method,
because all functions requiring a lower working pressure, might be operated.



LOW SAFETY NEEDS

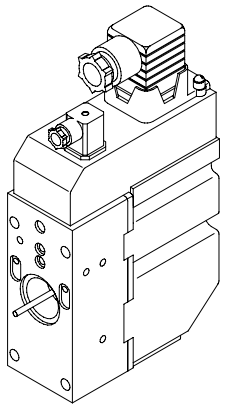
MHPE-D passive version

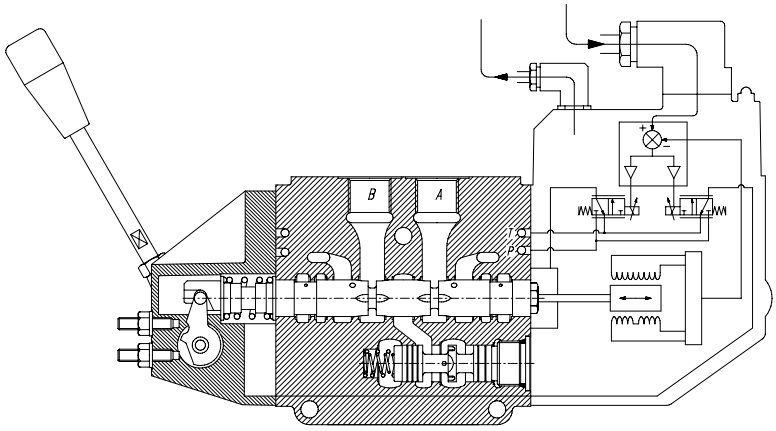
In this solution, the only safety feature is the remote control neutral switch (apart from the general emergency in position "E").
There is no protection against hydraulic and mechanical faults, and the hydraulic characteristics (remaining ΔP) described in para. "NORMAL SAFETY NEEDS" must be taken into consideration.



The diagrams previously described represents just a few possibilities advised by Brevini Hydraulics experience of how the assesment of degree of protection system ought always to be made.

This does not mean that considering the enormity of the subject and need for ever-increasing flexibility and performance of the industrial machinery with tighter and tighter safety rules, custom-built solutions can not be taken into account.





MHPEP–D PROPORTIONAL ACTIVATION MODULE

MHPEP–D closed loop electrohydraulic proportional activation unit is the most advanced version of the closed loop control modules.

It is defined by :

- *spool direction indicator output;*
- *capacity to handle three different kinds of input signal control. The required signal control is to be stated in the order phase, and is to be carried out at the factory, but it can be easily changed via a PROGRAMMING CONTROL PANEL provided by Brevini Hydraulics;*
- *inductive transducer position, LVDT (Linear Variable Differential Transformer);*
- *integrated PWM (Pulse Width Modulation);*
- *fault monitoring, transistor output for signal source;*
- *excellent regulation;*
- *low hysteresis;*
- *short reaction time.*

MHPEP–D TECHNICAL DATA

Rated voltage			$12V_{DC}$	$24V_{DC}$
Supply voltage		range	11 to 15 V	20 to 28 V
		max. ripple	5 %	
A*	Input signal control	neutral position	0.5 x U_{DC}	
		control range	0.25 x U_{DC} to 0.75 x U_{DC}	
	Max. current signal control		0.5 mA	1 mA
	Input impedance in relation 0.5 x U_{DC}		12 kΩ	
B*	Input signal control		0 – $10V_{DC}$	
		neutral position	$5V_{DC}$	
		control range	0.25 x $10V_{DC}$ to 0.75 x $10V_{DC}$	
	Current signal control		0.5 mA	
	Input impedance in relation 0 – $10V_{DC}$		20 kΩ	
C*	Input signal control		0 – 20 mA	
		neutral position	10 mA	
		control range	0.25 x 20 mA to 0.75 x 20 mA	
	Input impedance in relation 4 – 20 mA		0.5 kΩ	
Current supply			520 mA	260 mA
Current consumption (neutral position, constant voltage)			36 mA	46 mA
Power consumption			6 W	
Fault monitoring		max. current on safety output (pin no. 3)	50 mA	
		reaction time at fault	550 ms	
Max. current output signal for indication actuating direction			50 mA	
Reaction time (constant voltage)		from neutral position to max. spool travel	min. 110 ms – max. 140 ms	
		from max. spool travel to neutral position	min. 70 ms – max. 90 ms	
Reaction time (neutral switch)		from neutral position to max. spool travel	min. 130 ms – max. 170 ms	
		from max. spool travel to neutral position	min. 70 ms – max. 90 ms	
Grade of enclosure (IEC 529)			IP 65	

A* , B* , C* = SEE THE CODE No. IN THE FOLLOWING PAGES

DESCRIPTION

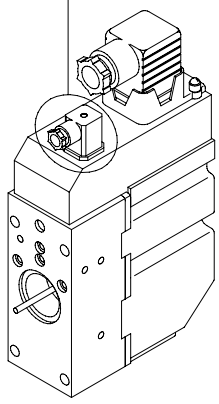
Besides the features afore mentioned, another purpose of the module is to give an indication of the spool's movement, through an on/off output signal in the smaller connector (also when the spool is manually activated).
The two enclosed diagrams show an example of how the direction output can be handled to activate or deactivate the LS on/off pilot solenoid valve by means of the two relay (K1 – K2) and two electrical end of strokes.

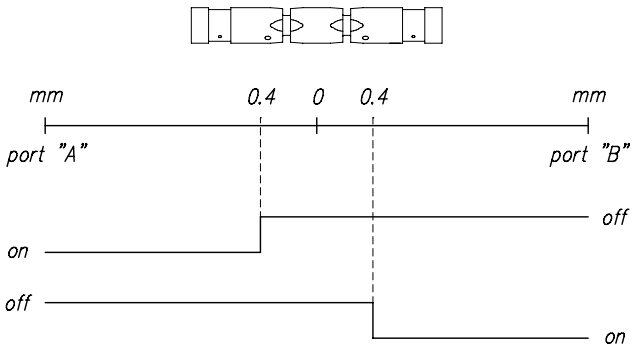
This is just an example, as the use of MHPEP–D is also destined for more demanding surroundings, that is solutions using artificial intelligence which dialogue at the higher level via bus, and which realize a real distributed control system able to carry out "stand–alone" processes.
This in turn send to the raised level only that information read as "positive" for the safe handling of machine.

All the electrohydraulics features, performance, and choice of safety degree system, are the same of those already described for the MHPE–D module.

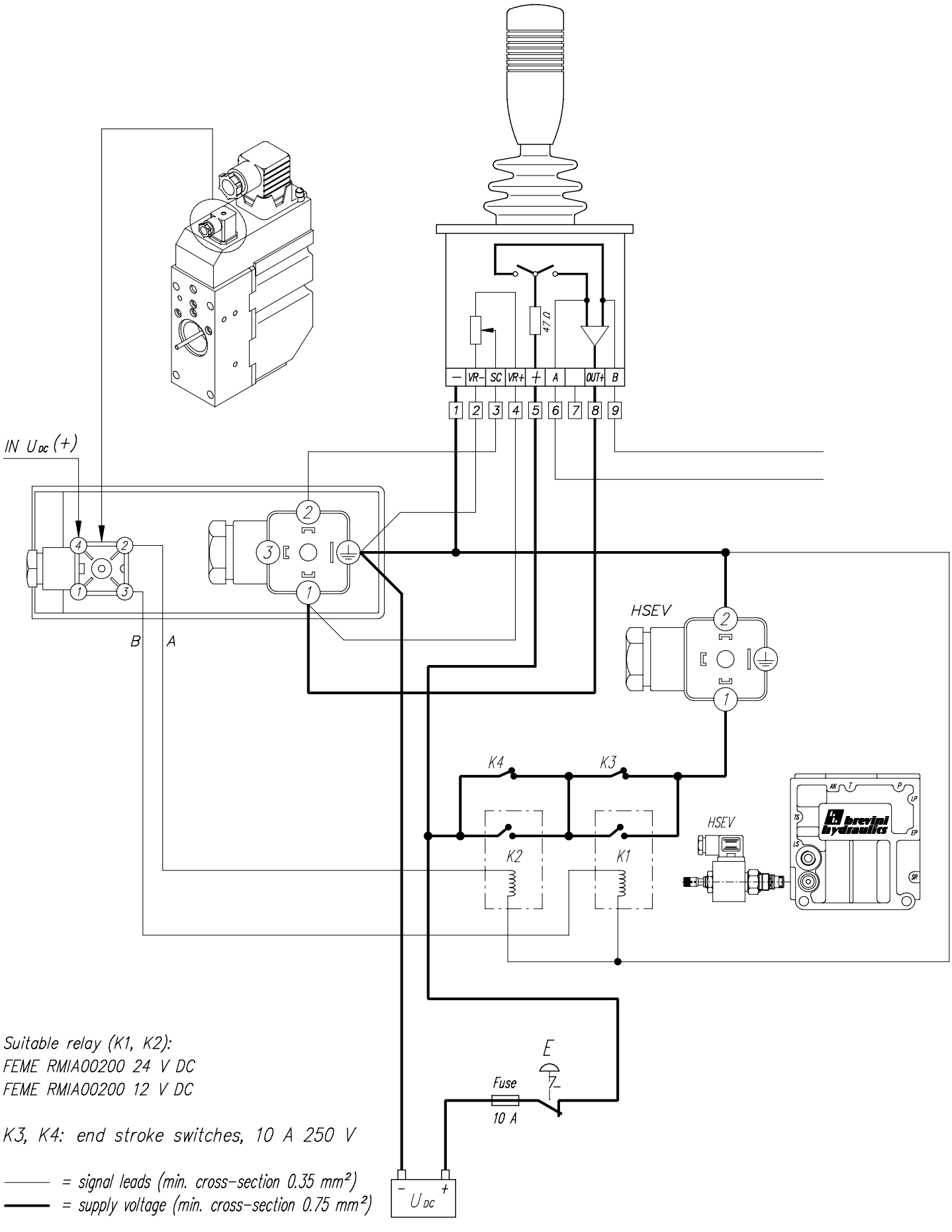
SPOOL DIRECTION SIGNALS

	Center position	Movement to A-port	Movement to B-port
PIN 1	free	free	free
PIN 2	no output	U_{DC} (+)	no output
PIN 3	no output	no output	U_{DC} (+)
PIN 4	To get the manual control this pin must be feeded with the supply voltage. To get the remote control the supply voltage must be taken off from this pin.		





SPOOL DIRECTION SIGNAL CONNECTIONS (WITH THE USE OF THE REMOTE CONTROL NEUTRAL SWITCH)

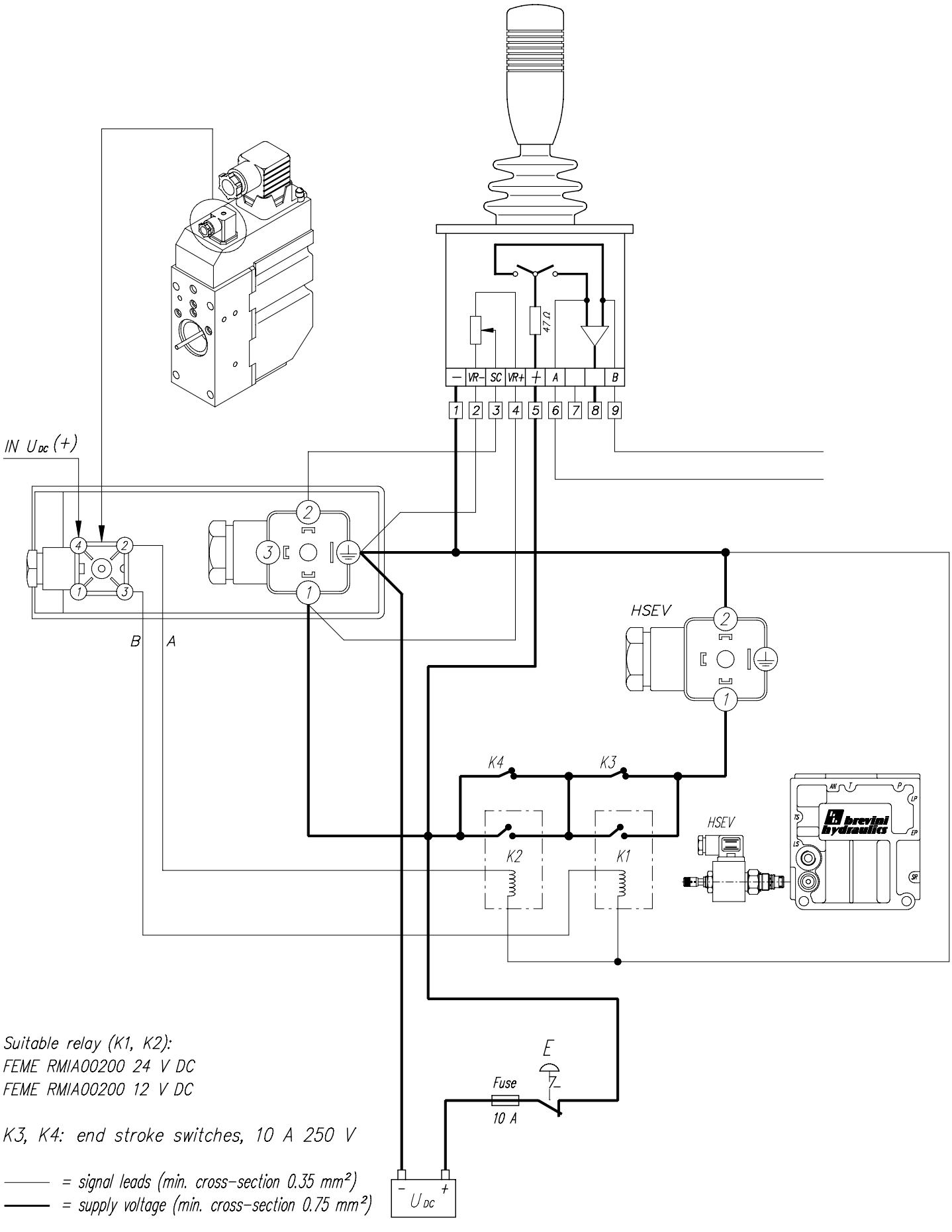


Suitable relay (K1, K2):
FEME RMIA00200 24 V DC
FEME RMIA00200 12 V DC

K3, K4: end stroke switches, 10 A 250 V

——— = signal leads (min. cross-section 0.35 mm²)
━━━ = supply voltage (min. cross-section 0.75 mm²)

SPOOL DIRECTION SIGNAL CONNECTIONS (WITHOUT USING THE REMOTE CONTROL NEUTRAL SWITCH)



Suitable relay (K1, K2):
FEME RMIA00200 24 V DC
FEME RMIA00200 12 V DC

K3, K4: end stroke switches, 10 A 250 V

——— = signal leads (min. cross-section 0.35 mm²)
——— = supply voltage (min. cross-section 0.75 mm²)

MHPE-D MODULE BEHAVIOUR IN RELATION TO THE SIGNAL CONTROL (BOTH PASSIVE AND ACTIVE VERSION)

U_{DC}	SIGNAL CONTROL	EARTH	SAFETY OUTPUT (Pin 3)	EFFECT
24V	12V (50% of U_{DC})	connected	no output	spool held electrically in neutral position
24V	6V (25% of U_{DC})	connected	no output	full flow P > A
24V	18V (75% of U_{DC})	connected	no output	full flow P > B
24V	20.4V (85% of U_{DC})	connected	output	spool stays in neutral position (red light comes on)
24V	21.6V (90% of U_{DC})	connected	output	spool stays in neutral position (red light comes on)
24V	24V (100% of U_{DC})	connected	output	spool stays in neutral position (red light comes on)
24V	0V (0% of U_{DC}) selected	connected	output	spool stays in neutral position (red light comes on)
24V	0V (0% of U_{DC}) interrupted	connected	output	spool stays in neutral position (red light comes on)
24V	1V (4% of U_{DC})	connected	output	spool stays in neutral position (red light comes on)
0V	15.6V (65% of U_{DC})	connected	no output	spool stays in neutral position (no light)
24V	15.6V (65% of U_{DC})	disconnected	no output	spool stays in neutral position (no light)

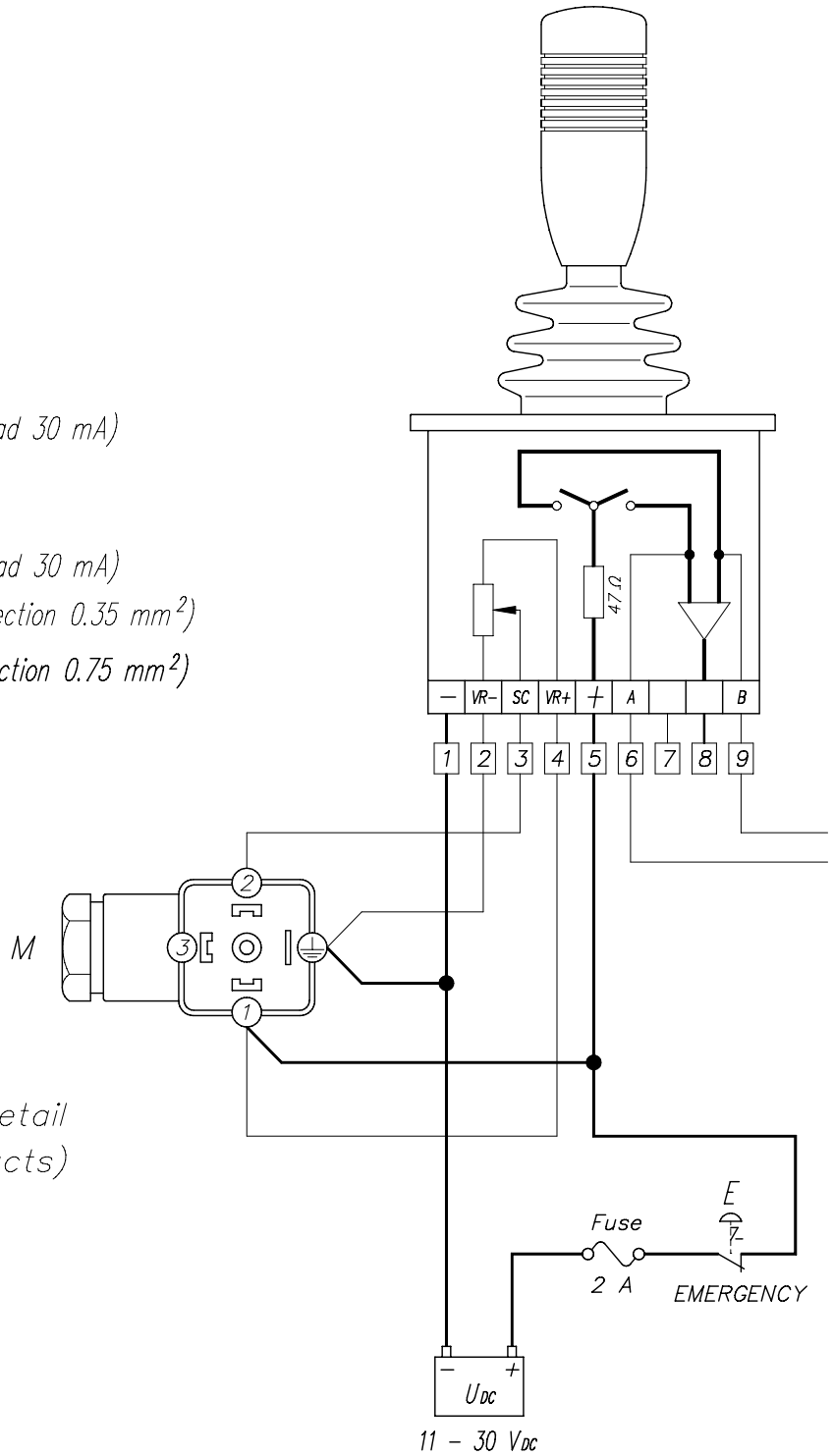
With the same data, given in percentages, the behaviour of the module is equal to the 12V DC, 4 – 20 mA and 0 – 10 V DC also.

As previously stated, when an error state is detected the lamp of the module starts flashing red, and the number of flashes indicates the probable cause of failure (see chart below).

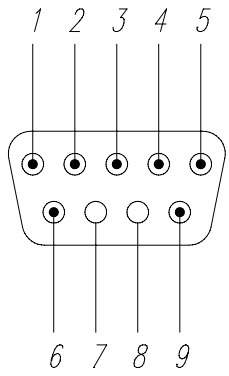
No. OF FLASHES	CAUSE
1	LVDT outside its own position
2	the demanded spool position doesn't correspond to the input signal
3	LVDT broken
4	short circuit in the output signal for indicator direction (MHPEP-D)
5	internal electrical faults
6	short circuit in the proportional solenoid valves
7	short circuit in the warning output signal (pin No. 3)
8	input signal control exceeds min/max values (15%-85% of supply voltage)

WITHOUT USING THE REMOTE CONTROL NEUTRAL SWITCH

1 = U-
2 = Negative signal
3 = Signal control
4 = Positive signal
5 = U+
6 = "A" port, directional output (max. load 30 mA)
7 = (free)
8 = (free)
9 = "B" port, directional output (max. load 30 mA)
——— = signals leads (min. cross-section 0.35 mm²)
——— = supply leads (min. cross-section 0.75 mm²)

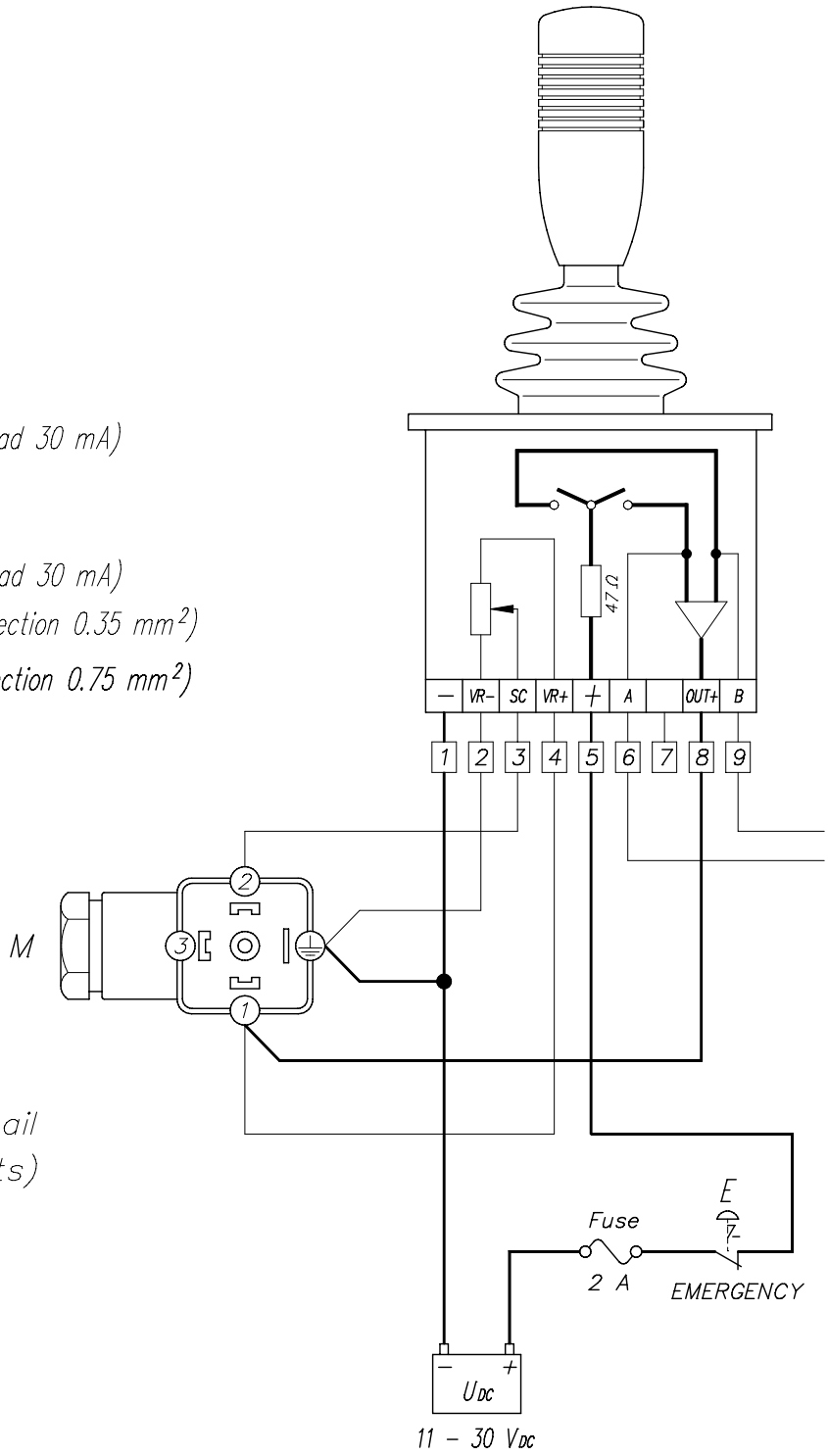


Joystick connector detail
(SUB D9-male contacts)

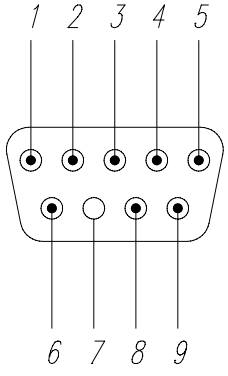


WITH THE USE OF THE REMOTE CONTROL NEUTRAL SWITCH

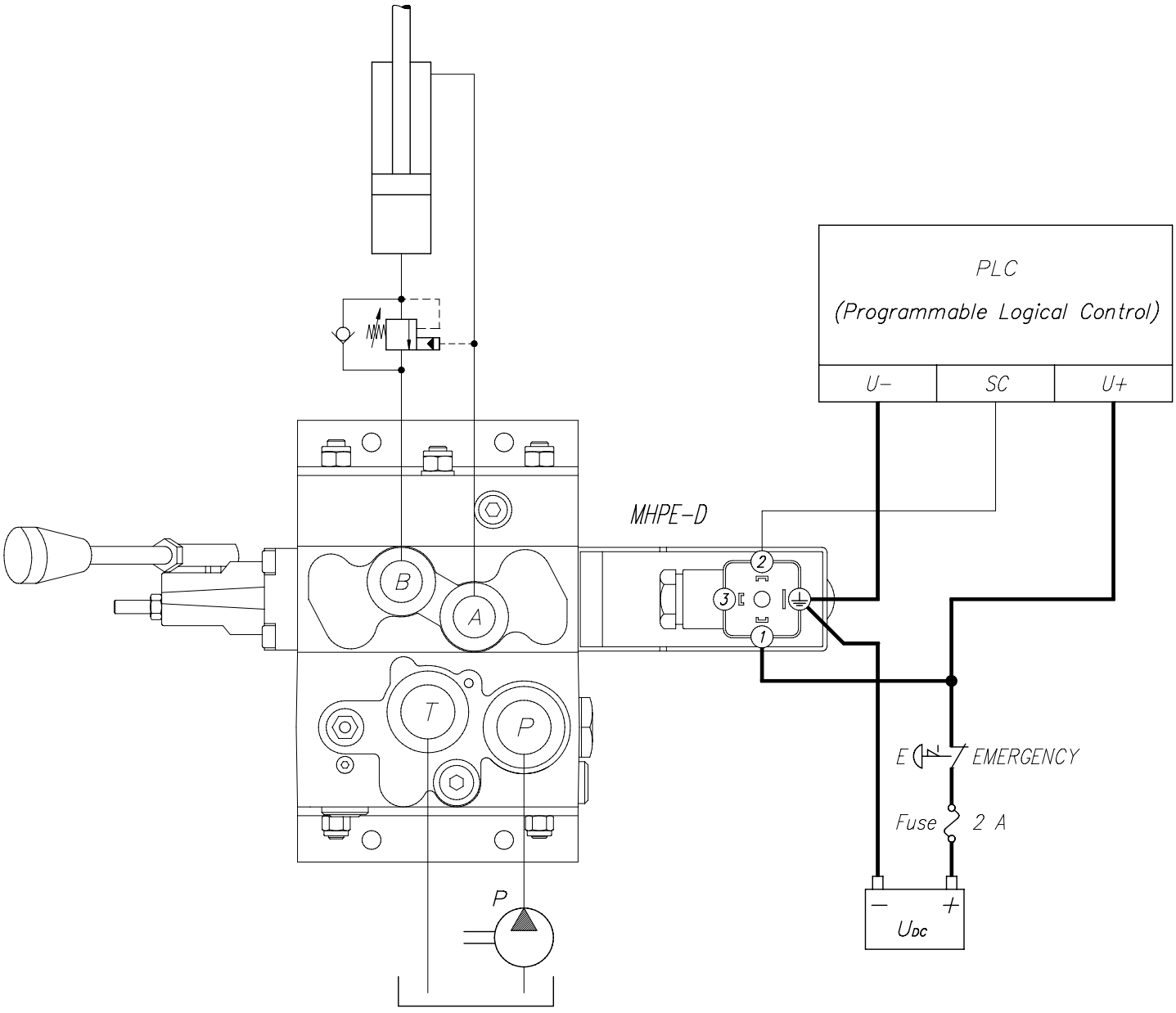
1 = U-
2 = Negative signal
3 = Signal control
4 = Positive signal
5 = U+
6 = "A" port, directional output (max. load 30 mA)
7 = (free)
8 = Output +
9 = "B" port, directional output (max. load 30 mA)
——— = signals leads (min. cross-section 0.35 mm²)
——— = supply leads (min. cross-section 0.75 mm²)



Joystick connector detail
(SUB D9-male contacts)

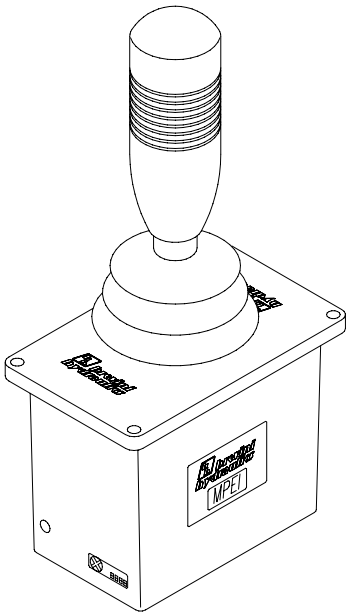


CONNECTIONS FOR BOTH 4-20 mA AND 0-10 V SIGNAL CONTROL



SIGNAL CONTROL	supply voltage (U_{DC})	active version		passive version	
		$12V_{DC}$	$24V_{DC}$	$12V_{DC}$	$24V_{DC}$
	CODE no.				
0.5 x U_{DC}	MHPE–D	4108002	4108004	4108006	4108008
0 – 10V		4108018	4108020	4108022	4108024
0 – 20 mA		4108026	4108028	4108030	4108032
0.5 x U_{DC}	MHPEP–D	4108042	4108044	4108038	4108040
0 – 10V		4108058	4108060	4108054	4108056
0 – 20 mA		4108066	4108068	4108062	4108064

SIGNAL CONTROL	supply voltage (U_{DC})	active version		passive version	
		12V$_{DC}$	24V$_{DC}$	12V$_{DC}$	24V$_{DC}$
	CODE no.				
0.5 x U$_{DC}$	MHPE–D	7708002	7708004	7708006	7708008
0 – 10V		7708018	7708020	7708022	7708024
4 – 20 mA		7708026	7708028	7708030	7708032
0.5 x U$_{DC}$	MHPEP–D	7708042	7708044	7708038	7708040
0 – 10V		7708058	7708060	7708054	7708056
4 – 20 mA		7708066	7708068	7708062	7708064



GENERAL

MPEI is a compact and rugged single axis joystick, developed for use in those applications where fine control and handle functionality are paramount.

The electronic remote control units produce load current for the direct supply of proportional solenoids, enabling a quick introduction into service. Owing to its digital PCB, MPEI can be easily tailored to your needs and it is suited to panel mounting, and provide optimal user comfort in adverse and rough conditions also.

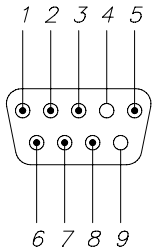
MPEI is characterised by:

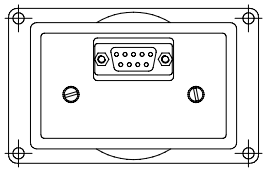
- *deadman's switch in hand grip;*
- *directional contacts for electrical monitoring of spool valve movement;*
- *electronic built-in flow adjustment;*
- *programming of operating curves for each power output;*
- *possible matching to solenoid data;*
- *electronic built-in ramp generator;*
- *electrical neutral position switch;*
- *signal inversion.*

PROGRAMMING CURVES	Because of the programming of the control parameters, the remote control MPEI can be suitably matched to each actuator to be controlled. Unless ordered otherwise, the remote MPEI are supplied with standard parameters for our MHPF modules.
DIRECTIONAL CONTACTS	Direction switch outputs for A or B port cut in, as soon as the joystick is operated in the respective direction. Direction signals A and B follow the proportional signal in the non-inverted setting. Therefore, if the proportional signal is inverted, there will be no relationship between the proportional signal and directional switch operating directions.
FLOW ADJUSTMENT	For each proportional function, the oil flow can be adjusted by means of a dip-switch and a potentiometer that can be set from the side of the joystick. This potentiometer independently limits the signal current for A and B direction and thereby limits the flow from A and B port of the proportional valve, without the movement of the remote control handle being limited.
DEADMAN'S SWITCH	Deadman's switches or the center lock can be specified to improve the integrity of your control system.
BUILT-IN RAMP GENERATOR	A time ramp function is included in the amplifier and may be changed by the side of the joystick by means of a trimming potentiometer. The setting range for the ramp times is approx. from 100 ms up to 5 s.
NEUTRAL POSITION SWITCH	The neutral position switch can be used to cut-off the voltage output to improve the integrity of the systems and to avoid unnecessary current consumption in neutral position.

SIGNAL INVERSION	With a switch that can be adjusted from the side of the joystick, each proportional signal can be inverted by changing the switch setting. In other words, in inverted setting, proportional signal A is associated with direction B and proportional signal B is associated with direction A. Note: Factory setting non-inverted

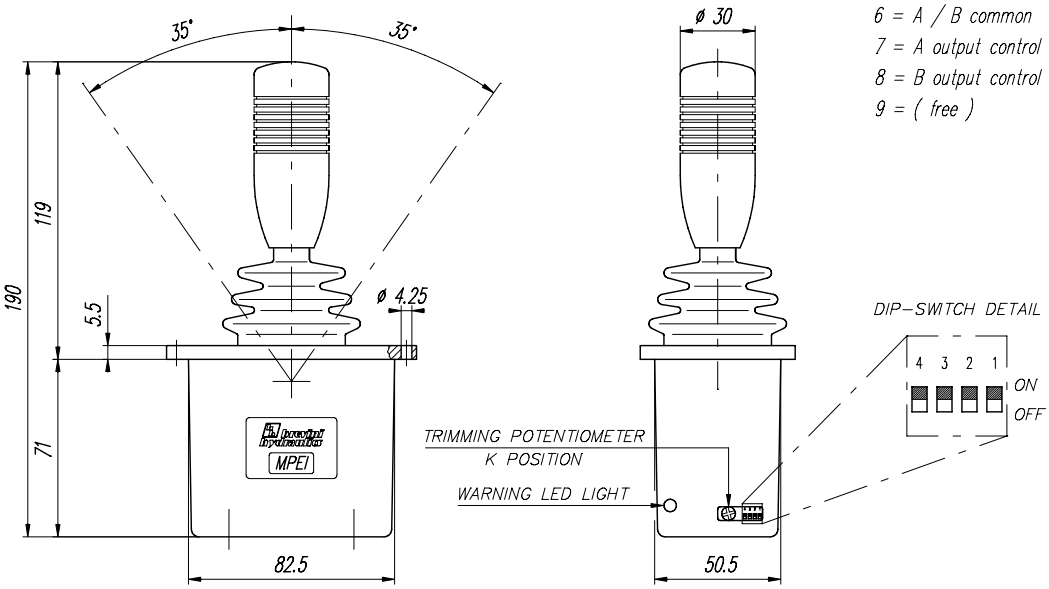
connector detail
(SUB D 9 male contacts)

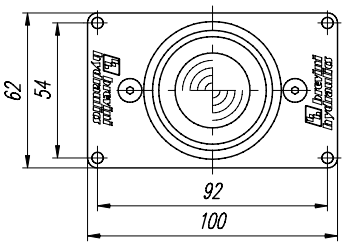




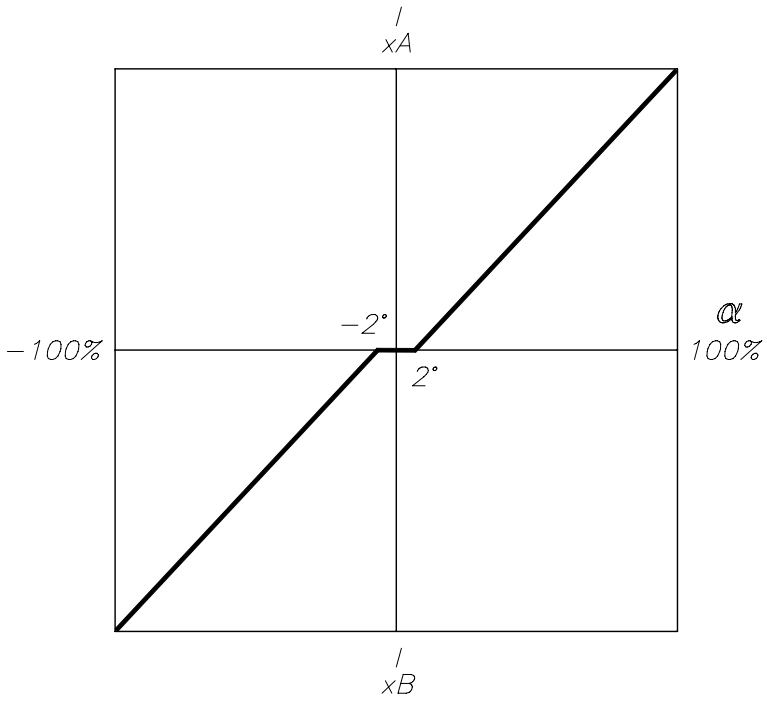
CABLE CONNECTIONS

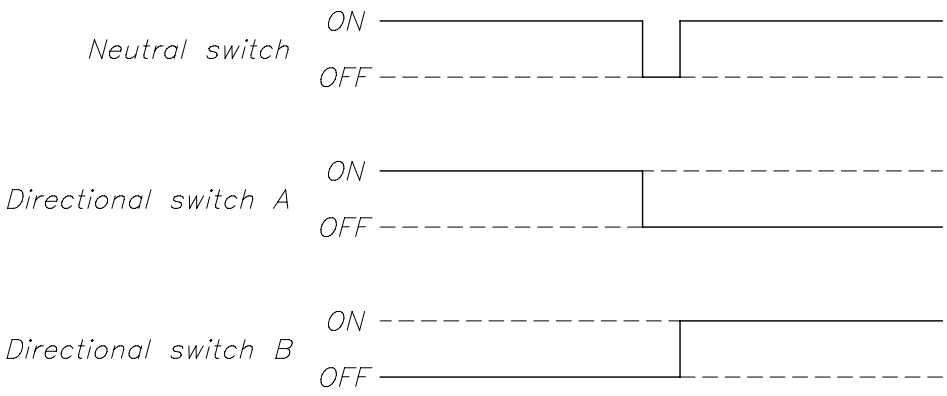
1 = U-
2 = A port directional switch
3 = B port directional switch
4 = (free)
5 = U+
6 = A / B common
7 = A output control
8 = B output control
9 = (free)

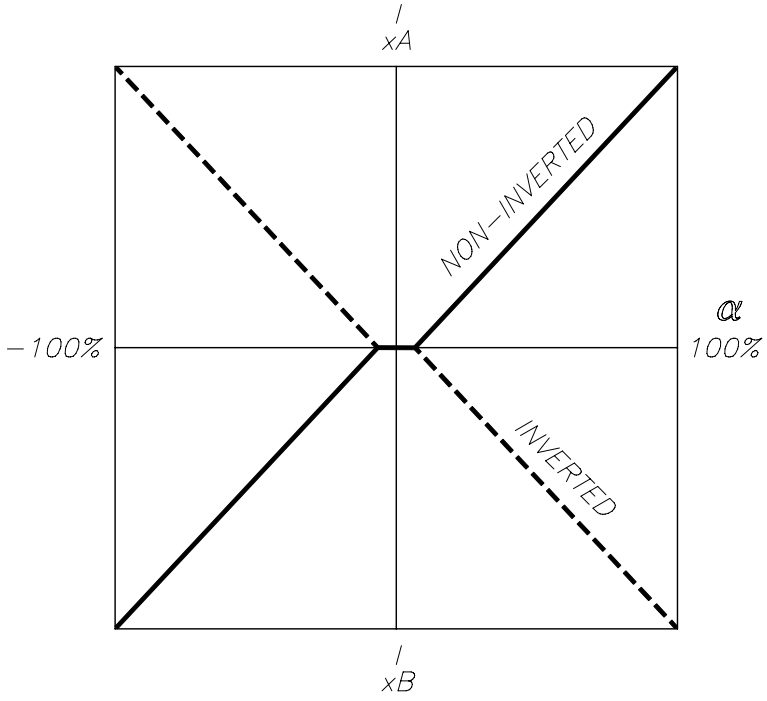




TECHNICAL DATA				
	Supply voltage, U		12 U_{DC}	24 U_{DC}
			11 ⩽ U ⩽ 15	20 ⩽ U ⩽ 28
	Max. ripple		5 %	
	Control output		380 → 900 mA	200 → 550 mA
	Current consumption		40 mA	
	Ramp times (0 to max. flow)		5 s	
	A / B oil flow adjustment		0 - 100 %	
	Dither regulation		45 → 200 Hz	
	Enclosure to IEC 529	over mounting flange	IP 65	
		under mounting flange	IP 23	
	Ambient temperature		-30° C to +60° C	







FLOW ADJUSTMENT

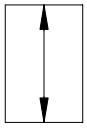
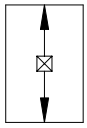
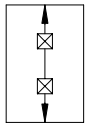
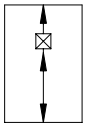
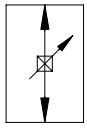
The oil flow can be reduced individually for ports A and B.
Q min: the dip-switch is to be set as follows:
1 = ON
2 = OFF
3 = OFF
4 = OFF
Afterwards, moves the joystick towards the port involved and the oil flow is to be adjusted by means of a trimming potentiometer in position K.
If the flow regulation is requested just in a port, all four switches related to the other one must be set in off position.

Q max: the dip-switch is to be set as follows:
1 = OFF
2 = ON
3 = OFF
4 = OFF
Afterwards, moves the joystick towards the port involved and the oil flow is to be adjusted by means of a trimming potentiometer in position K.
If the flow regulation is requested just in a port, all four switches related to the other one must be set in off position.

SIGNAL INVERSION

The dip-switch is to be set as follows:
1 = OFF
2 = OFF
3 = ON
4 = OFF
Afterwards, moves the joystick towards the port involved and the signal must be inverted by means of a trimming potentiometer in position K.

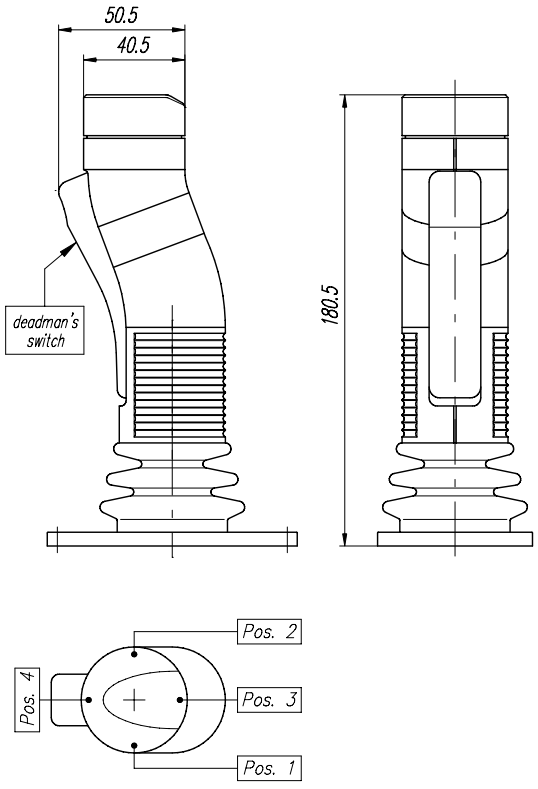
DITHER ADJUSTMENT	The dip-switch is to be set as follows: 1 = OFF 2 = OFF 3 = OFF 4 = ON Afterwards, moves the joystick towards the port involved and the dither value is to be adjusted by means of a trimming potentiometer in position K.
RAMP GENERATOR SETTINGS	A, B positive ramps time: The dip-switch is to be set as follows: 1 = ON 2 = OFF 3 = ON 4 = ON Afterwards, moves the joystick towards the port involved and the ramps time is to be adjusted by means of a trimming potentiometer in position K. If the ramp time is requested just in a port, all four switches related to the other one must be set in off position. A, B negative ramps time: The dip-switch is to be set as follows: 1 = OFF 2 = ON 3 = ON 4 = ON Afterwards, moves the joystick towards the port involved and the ramps time is to be adjusted by means of a trimming potentiometer in position K. If the ramp time is requested just in a port, all four switches related to the other one must be set in off position.

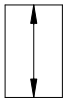
	 Spring centered	 Spring–centred with neutral position lock	 End travel lock	 Spring–centred with float position control	 Put and stay (friction lock)
12 V DC	M700505	M700506	M700507	M700508	M700509
24 V DC	M700510	M700511	M700512	M700513	M700514

HANDLES

DEADMAN'S SWITCH

Designed to provide a simple approach to a deadman's handle,
whilst offering the flexibility of multiple on/off switches,
up to 4, in the handle top.
These can be specified to be in any of the 4 on axis position.
(See drawing below)

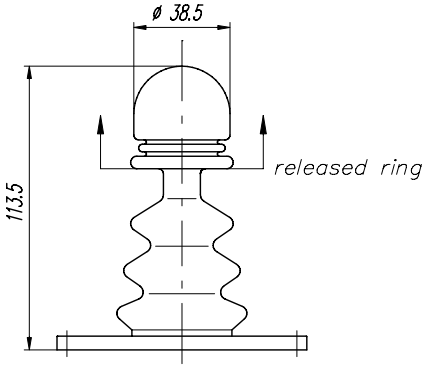


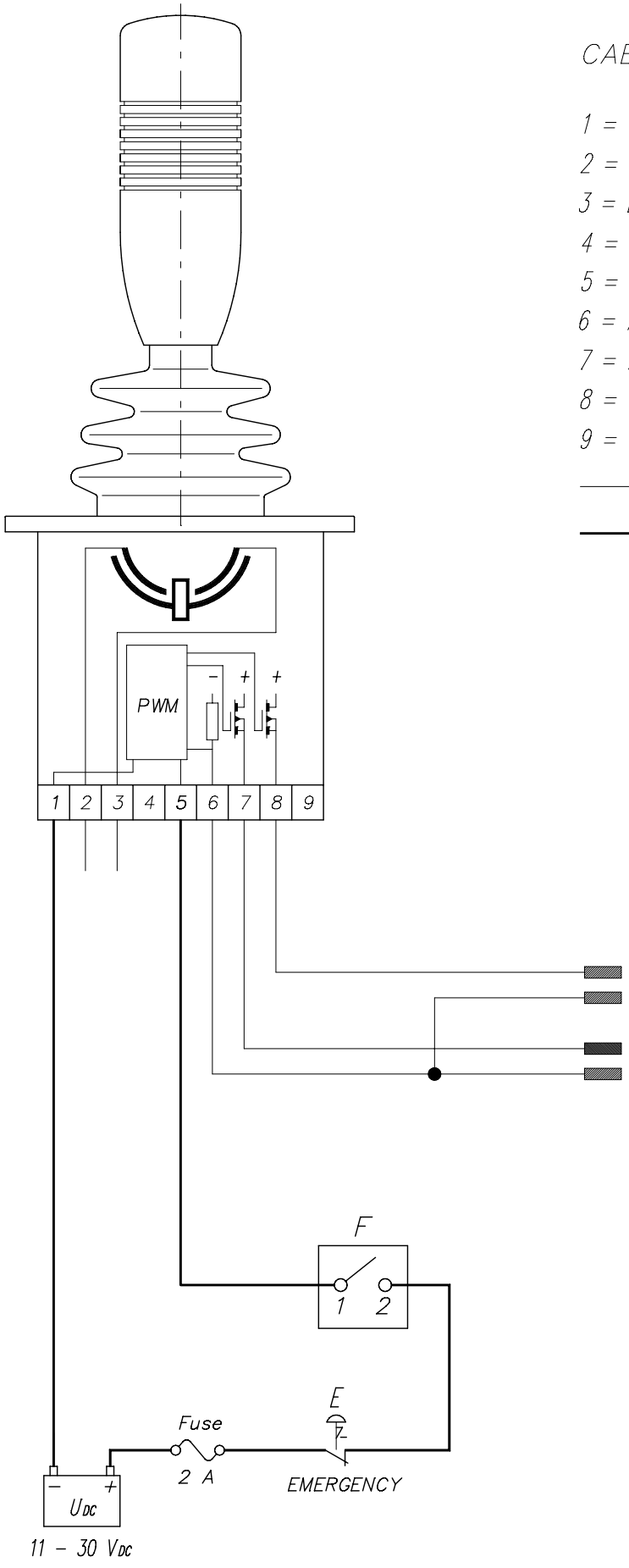

spring centered

Switches / Position				Code
				M700T00
1				M700T01
	1 2			M700T02
		1 3		M700T03
			1 4	M700T04
1	1 2			M700T05
1		1 3		M700T06
1			1 4	M700T07
	1 2	1 3		M700T08
	1 2		1 4	M700T09
		1 3	1 4	M700T10
1	1 2	1 3		M700T11
1	1 2		1 4	M700T12
1		1 3	1 4	M700T13
	1 2	1 3	1 4	M700T14
1	1 2	1 3	1 4	M700T15

NEUTRAL AND END–TRAVEL LOCK

Developed to improve control system integrity,
the center lock and end–lock range of handles,
mechanically hold the shaft in its safe center position
or at either end–travel.
The position lock can be released
by lifting the release ring under the handle.



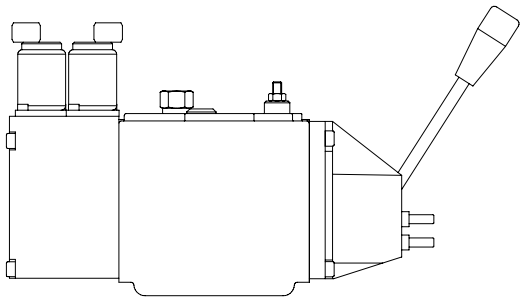


CABLE CONNECTIONS

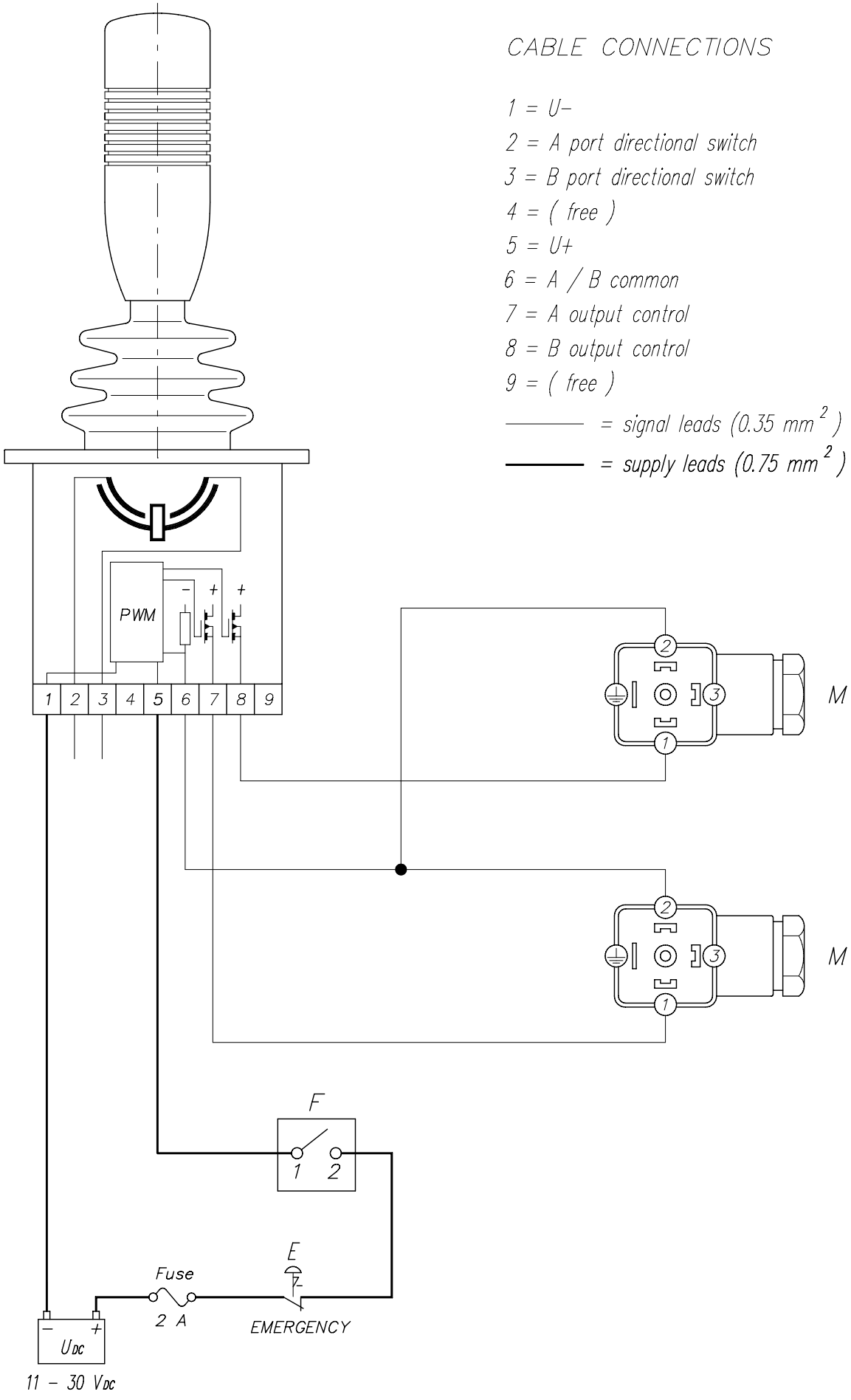
1 = U–
2 = A port directional switch
3 = B port directional switch
4 = (free)
5 = U+
6 = A / B common
7 = A output control
8 = B output control
9 = (free)

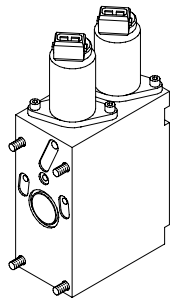
——— = signal leads (0.35 mm²)

——— = supply leads (0.75 mm²)

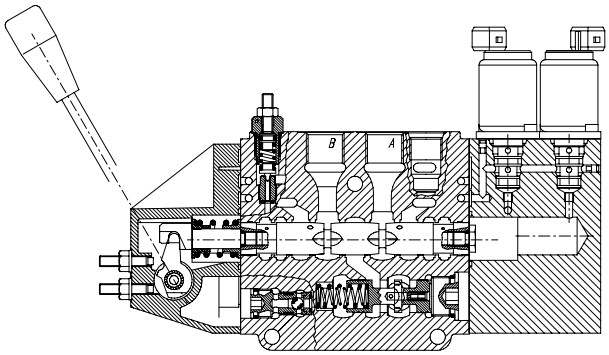


MHPF module



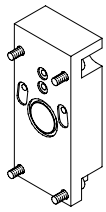


MHPF module with handle control

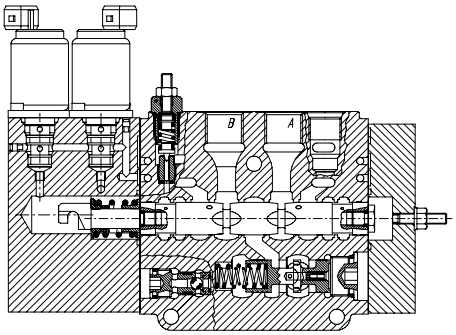


Ordering code

HPV 41	12 V DC	24 V DC
Aluminium	4107016	4107015
Cast iron	4107036	4107035
HPV 77	12 V DC	24 V DC
Aluminium	7707077	7707076
Cast iron	7707057	7707056



HCF rear cover module
for MHPF module with no handle control

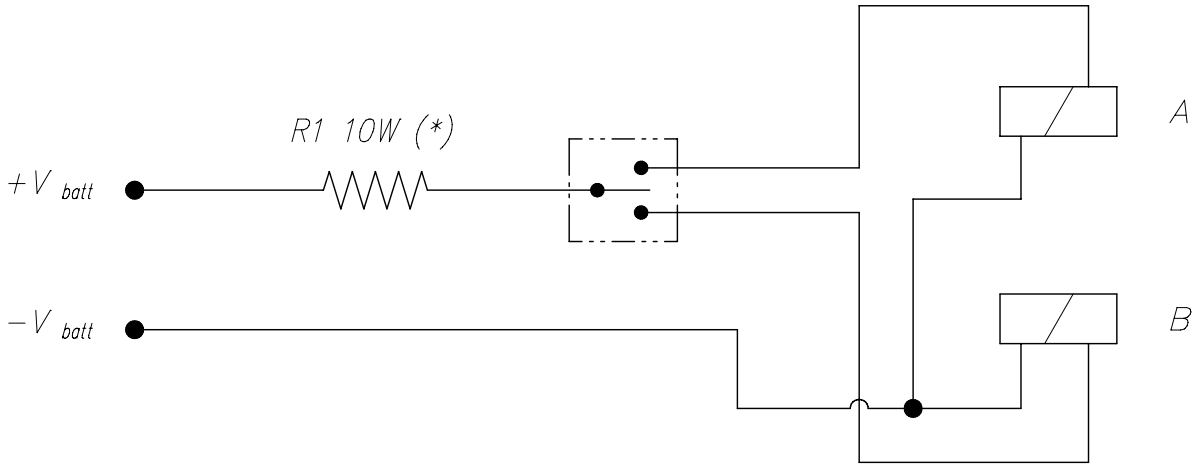


Ordering code

HPV 41	
Aluminium	4103996
Cast iron	4103997
HPV 77	
Aluminium	7704587
Cast iron	7704584

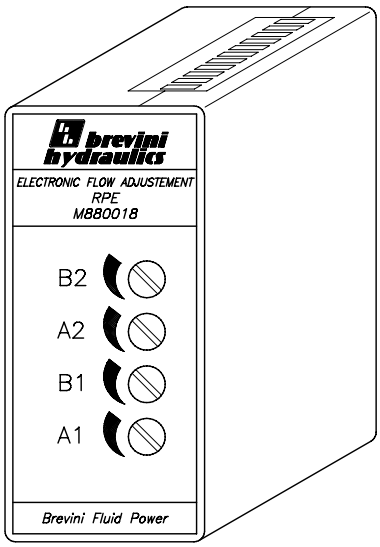
rated voltage	12 V DC	24 V DC
range voltage	11 to 15 V	22 to 30 V
max. ripple	8 %	
max. current	1500 mA ±10	750 mA ±10
start spool travel	510 mA	280 mA
end spool travel	870 mA	485 mA
R_{20}	5.3 Ω ±5%	21.2 Ω ±5%
dither adjustement	75 Hz	
Inductance	8.5 mH	70 mH
current variation	100 mA/s	50 mA/s
duty cycle % ED	14 V = 100	28 V = 100
	15 V = 50	30 V = 50
plug connector	2-pole AMP Junior Power Timer	
reaction time from neutral position to max. spool travel (constant voltage)	120 ms	
reaction time from max. spool travel to neutral position (constant voltage)	90 ms	
grade of enclosure (IEC 529) with female connector	IP 65	

(*) Utilizzare resistenze in cassa metallica come da campione, montate su una parete in grado di dissipare calore



R1 = 4.7Ω per bobine a 12 V
R1 = 22Ω per bobine a 24 V

DESCRIPTION



RPE, elctronic flow adjustment unit, is being used whrn the hydraulic system requires a flow limitation from the two ports of the HPV proportional valve, as a function of the electrical input signal.

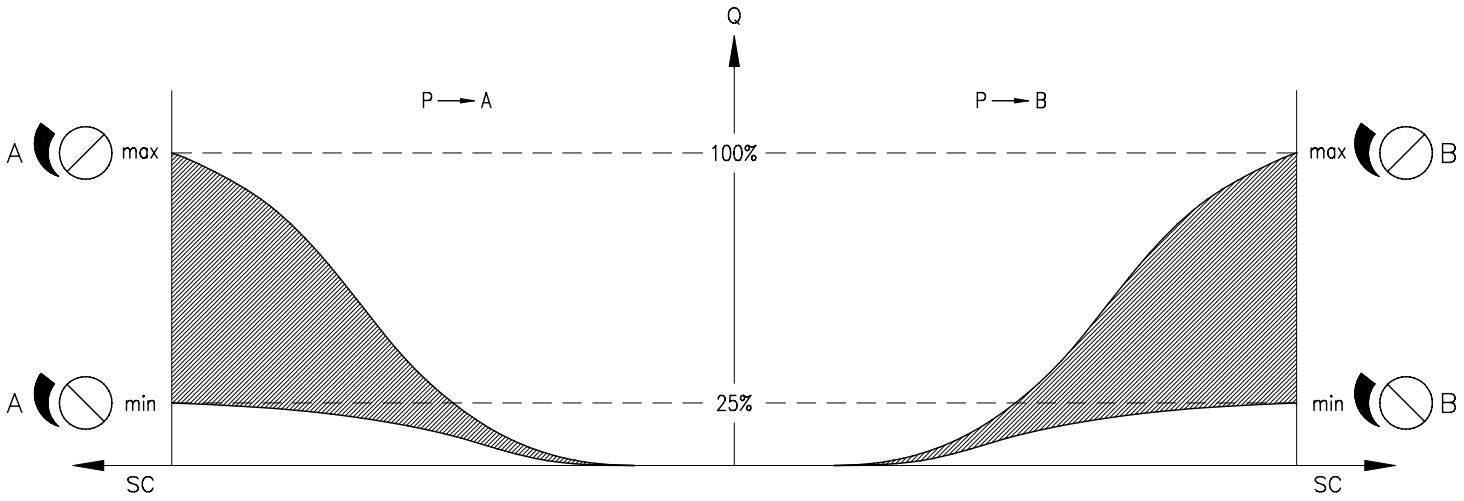
Typical application is where the HPV is to provide a creep speed on the travel function for precise location and a high speed travel mode also, or when a HPV's working section is to operate two functions with different speed mode. (see diagrams in the following pages)

The flow can be reduced individually for ports A and B infinitely downto 25% of maximum flow.
RPE must be fitted in the signal control connection between the electric remote control unit and HPV proportional valve, and two proportional electrohydraulic modules (MHPE–D / MHPO–D) can be operated, simultaneously also.
The flow regulation is achieved through four built–in potentiometers (two per function) which independently of each other will limit the signal control and thereby the flow from ports A and B.

The sensitivity and the fine metering of the hydraulic system is not affected by the reduction of the signal control, because RPE, owing to its dead–band compensation function, allows to the remote control unit to retains its full regulation range.

CHARACTERISTICS

Flow as a function of the input signal
and the two potentiometers for the flow limitation at ports A and B



SIGNAL MONITORING

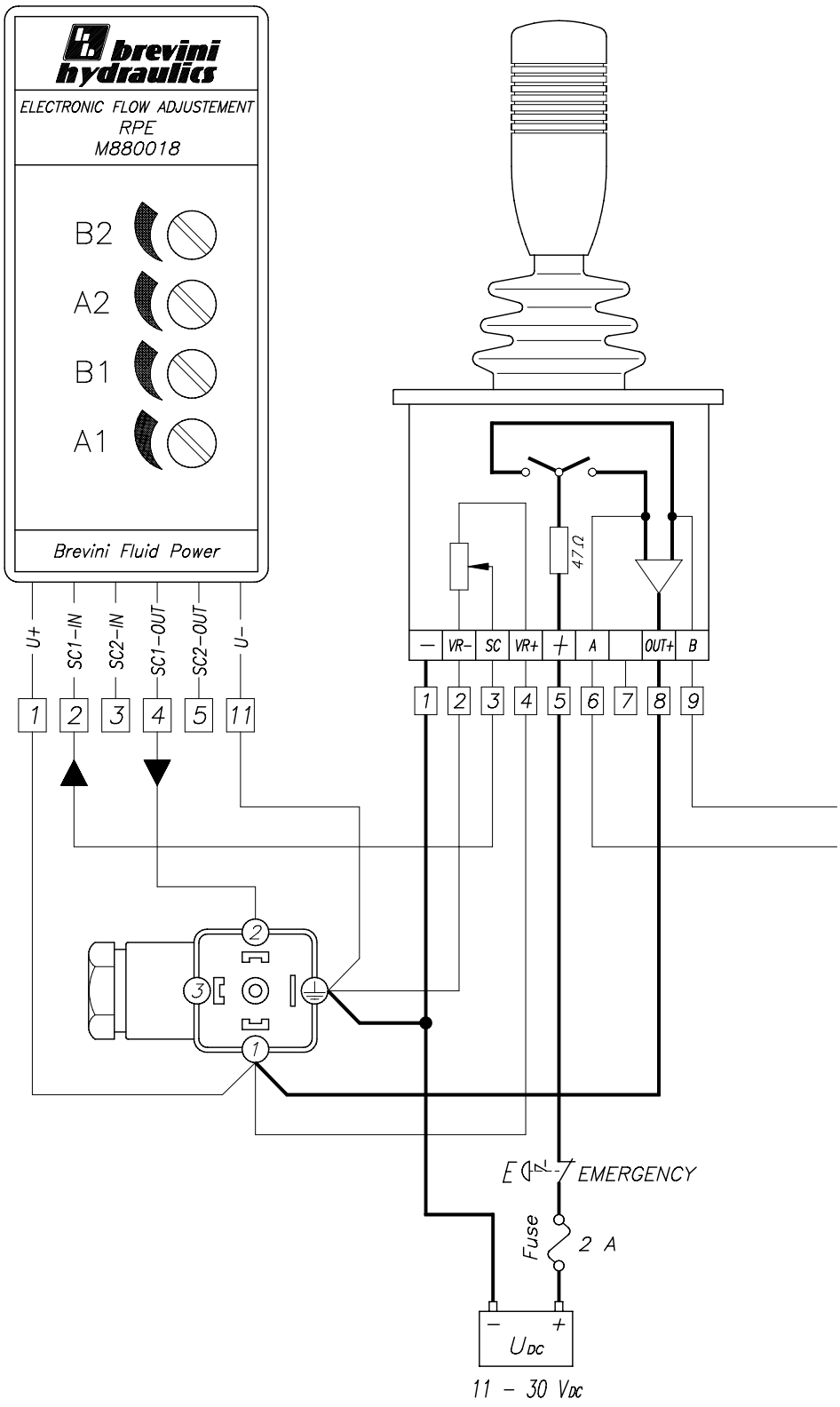
RPE has signal monitoring on the signal inputs.
This means that input signals must lie within the range 0.15 x U_{DC} to 0.85 x U_{DC} .
If the signal is outside the stated range, as a consequence of short circuit to plus or minus supply, the signal monitoring cuts off the output signal to the proportional valve which then immediately sets the main spool into neutral position.

If monitoring has cut off the output signal, RPE can only begin working again when the supply voltage has been cut off.

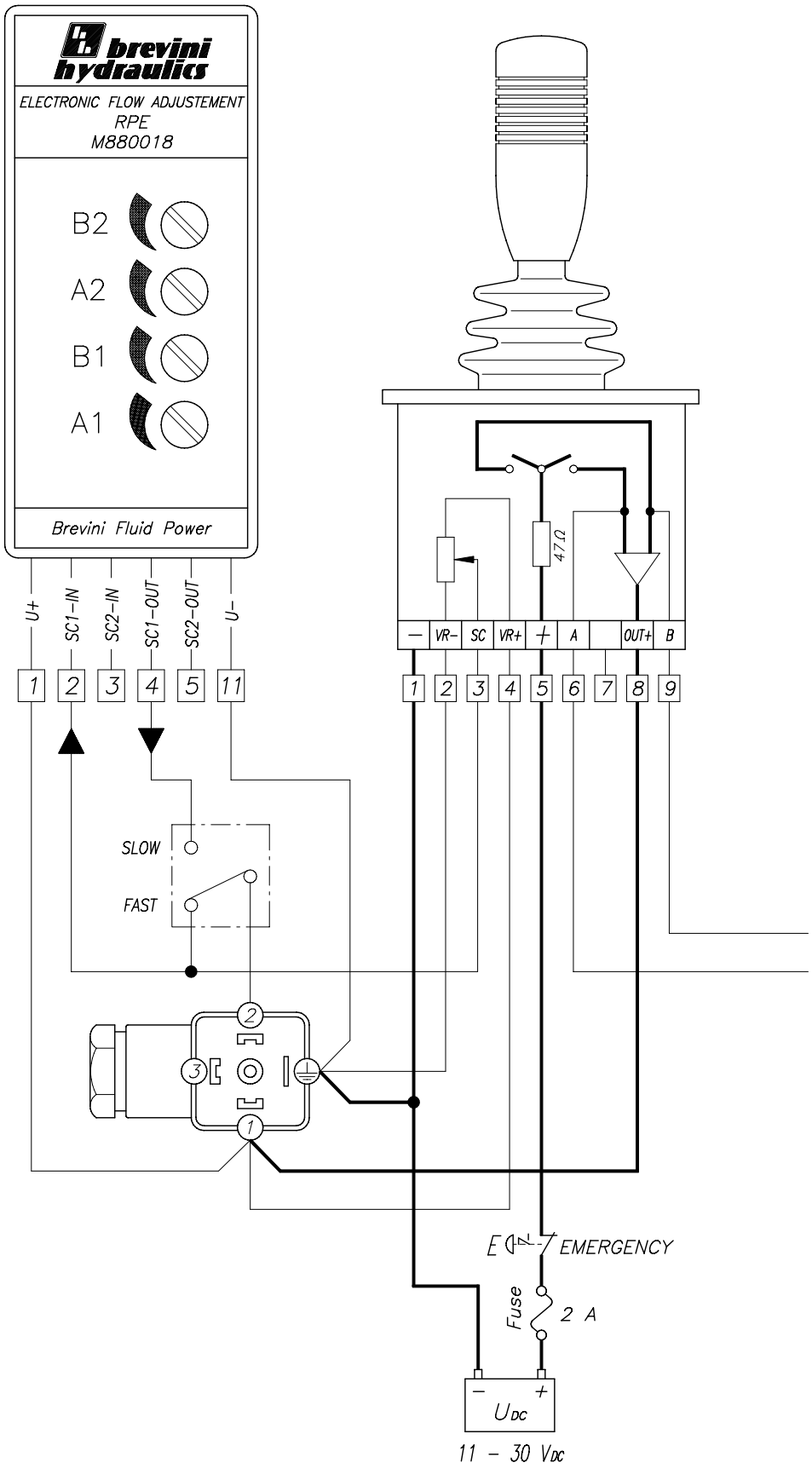
TECHNICAL DATA

Supply voltage		range	11 – 30 U_{DC}
		max. ripple	5 %
Neutral voltage (U_S)	U_S / U_{DC}		0.5
Control range (U_S)			0.25 x U_{DC} to 0.75 x U_{DC}
Current consumption			< 50 mA
Input signal			remote control
Input impedance			12 kΩ in relation to 0.5 x U_{DC}
Output signal		max. load	two MHPE–D parallel–connected
		min. load impedance in relation to 0.5 x U_{DC}	6 kΩ
Max. signal current		U_{DC} = 12 V	± 0.5 mA
		U_{DC} = 24 V	± 1.0 mA
Ambient temperature			–30°C to +60°C
Enclosure to IEC 529			IP 42

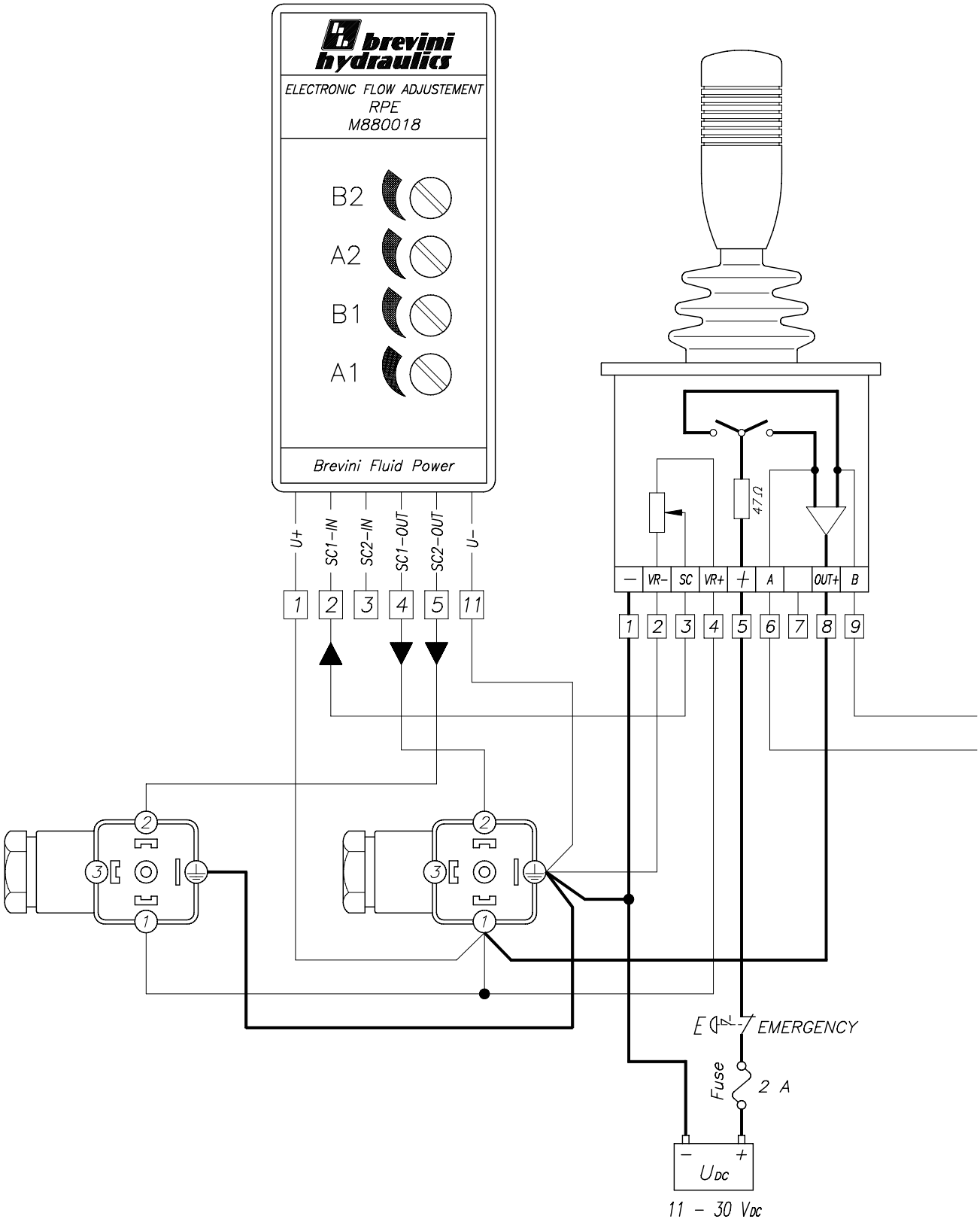
CODE NUMBER	M880018


brevini hydraulics
ELECTRONIC FLOW ADJUSTEMENT
RPE
M880018
B2
A2
B1
A1
Brevini Fluid Power
U+
SC1-IN
SC2-IN
SC1-OUT
SC2-OUT
U-
1
2
3
4
5
11
47Ω
—
VR-
SC
VR+
+
A
OUT+
B
1
2
3
4
5
6
7
8
9
EMERGENCY
Fuse
2 A
UDC
11 - 30 VDC

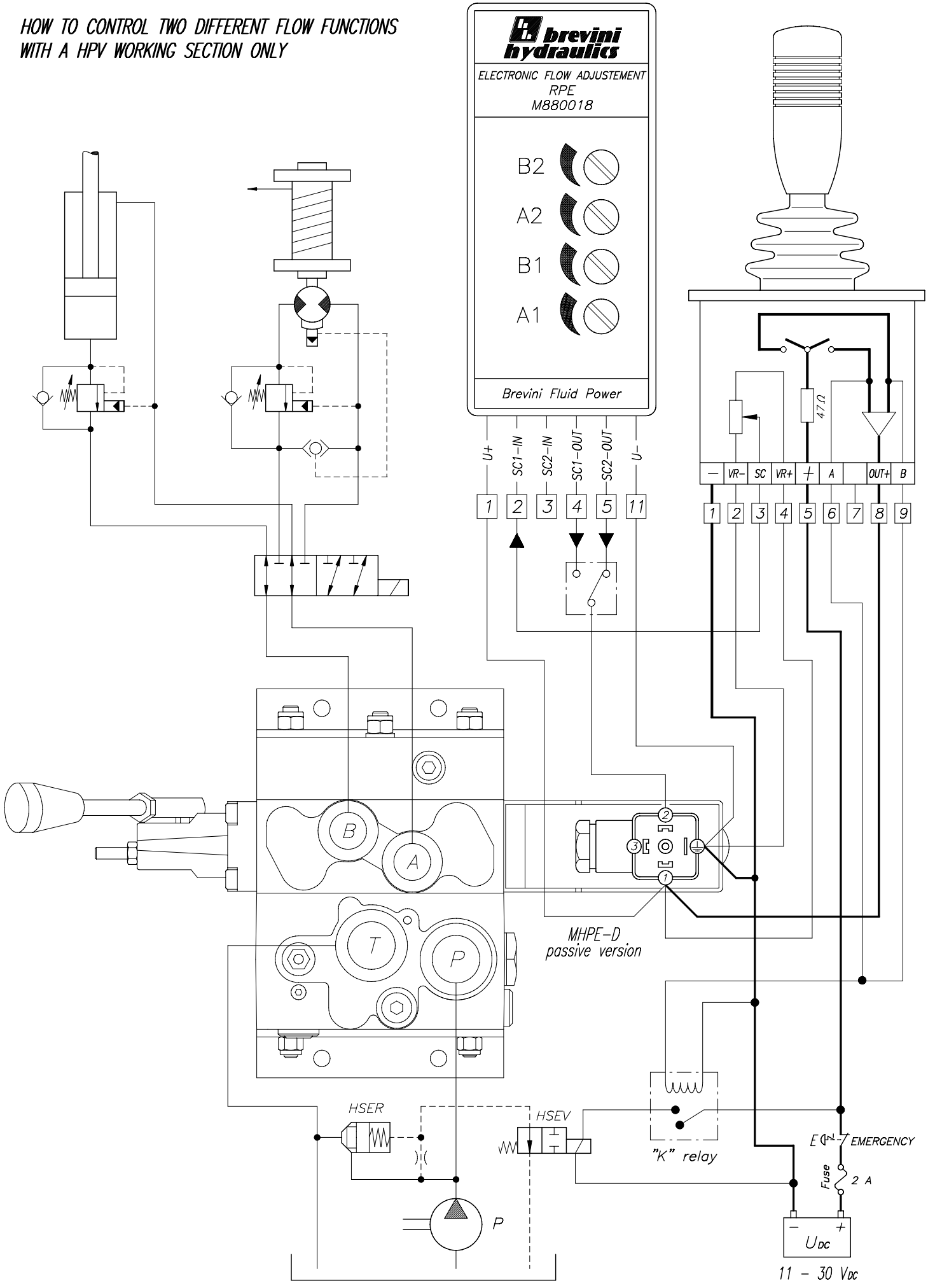
FAST / SLOW FUNCTION



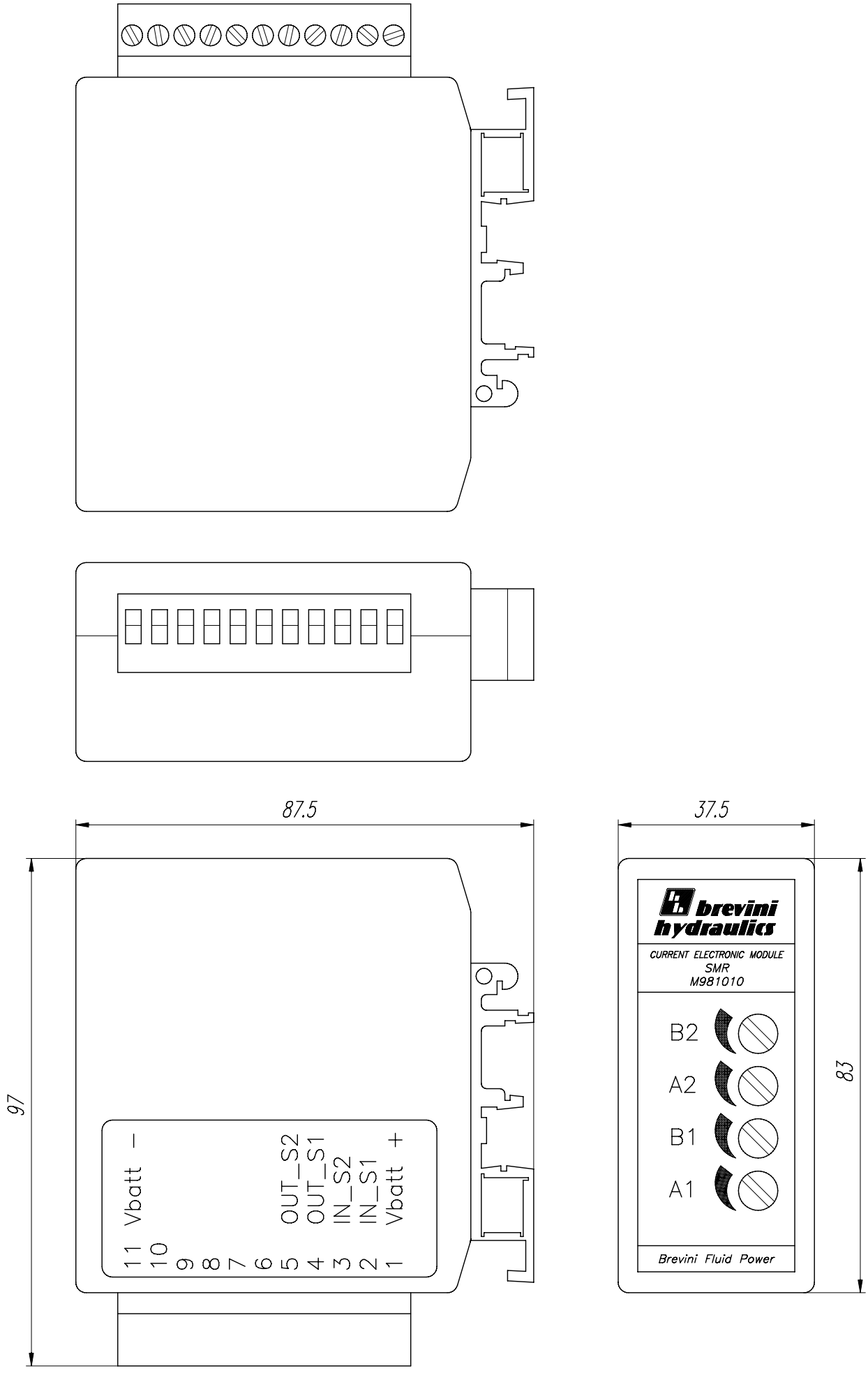
HOW TO CONTROL TWO DIFFERENT FLOW FUNCTIONS SIMULTANEOUSLY

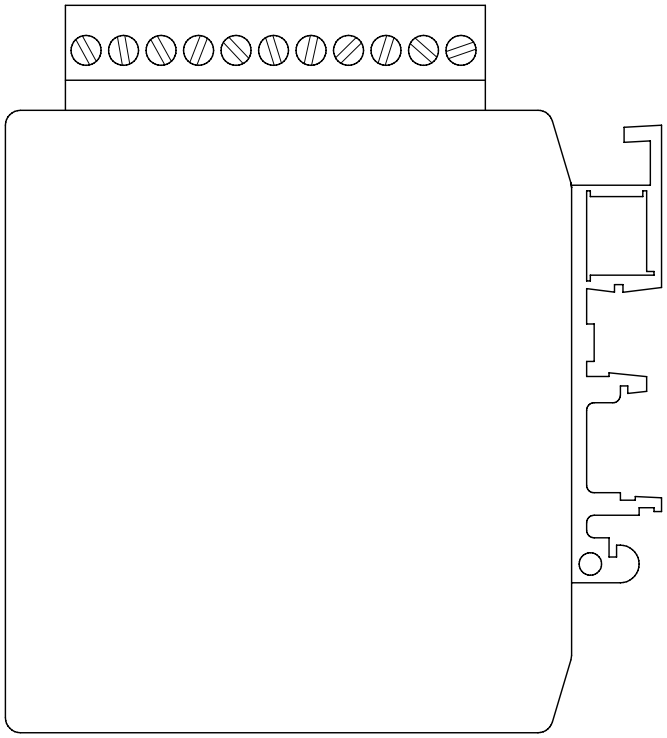


HOW TO CONTROL TWO DIFFERENT FLOW FUNCTIONS WITH A HPV WORKING SECTION ONLY



CURRENT ELECTRONIC MODULE, SMR – M981010
overall dimensions





(Aggancio su barra DIN)

DOCUMENTAZIONE PROVVISORIA