The “LRS” Power-reducing and Override DIN Plug

for DC-solenoid valves
Series LRSA 15…55 V DC, 100…250 V DC

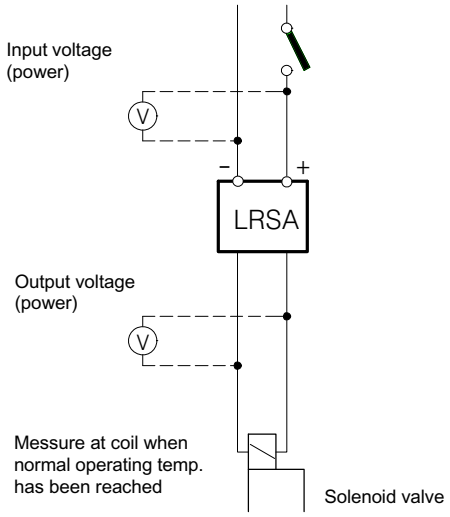
- Improved switching reliability
- Enables use of smaller solenoid valves (cost savings)
- Energy savings as high as 90 %
- Lower coil and valve temperatures and reduced global warming
- Protects against “over-voltage” (see examples A and C overleaf)
- Insensitive to “under-voltage” (see ex. B)
- Longer service life for coil and plug gasket
- Lower service costs
- Integral spark-supression
- With reverse-polarity protection

1 Description

The power-reducing plug, type LRSA…, is an electronic “chopper” which limits the voltage and power throughput. The output power level is set using the integral potentiometer “P”. The plugs directly onto the coil. For the first 0,8 secs after the external switch is closed, the full supply voltage is allowed through the plug to the DC solenoid coil. After this non-adjustable 0,8 secs the chopper (frequency approx. 1000 Hz) is automatically activated and has an ON / OFF ratio determined by the setting of the potentiometer “P”. The coil now “holds” with a correspondingly lower power consumption, but there is no wasteful energy loss. There are 3 possible modes of operation, shown in the examples A, B and C.

IMPORTANT!
In all applications, when setting the output power level remember that as the coil heats up the solenoid force will decrease, and also ailow an extra safety margin. If in doupt, test the application and/ or contact BUCHER.

2 Schematic



3 Technical data

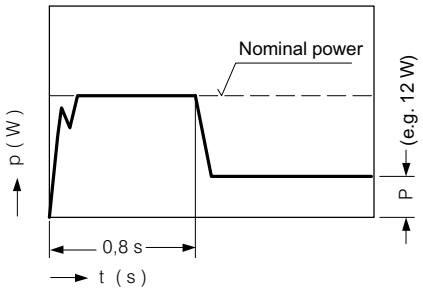
Electrical characteristics	Description, value, unit
Supply voltage, ripple up to 10 % max.	15…55 V DC 100…250 V DC
Supply voltage, ripple more than 10 %	condenser > 2000 µF at 15…55 V DC condenser > 2000 µF at 100…250 V DC
For use with coils of	max. 40 W
Holding power range „P“	100…10 % of application nominal
Duration of full power	0,8 second
Switching duty cycle	max. 1800 cycles / hour
Spark suppression	integral diode
Protection class to EN 60 529	IP 65
Operating temperature	-25…+75 °C
Operating temperature at max. switching frequency	-25…+40 °C

Electrical characteristics	Description, value, unit
Operating above 40 W (overdrive)	
I_{max} (at initial switch on)	5 A at 15…55 V DC 1 A at 100…250 V DC
Holding power setting	max. 40 W
Switching frequency at I_{max}	max. 600 cycles / hour

4 Application examples

Example A

Normal energisation then falling to less than nominal power



Switching mode:

- 0,8 secs nominal power
- then a reduction to the holding power

Result:

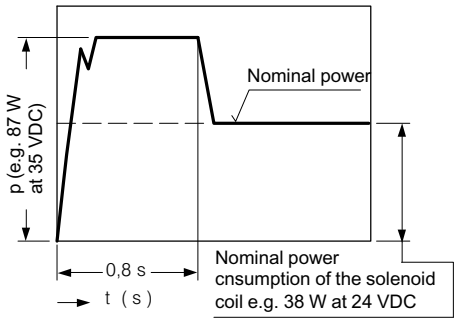
- cooler-running coils
- very significant energy savings
- faster switch-off response

Applications:

- continuously energised coils
- limited energy sources (e.g. batteries)
- use only with normal solenoid valves which require less power to hold than to initially shift

Example B

Overdriving the coil, then falling to nominal



Switching mode:

- 0,8 secs power input more than nominal
- then a reduction to nominal level

Result:

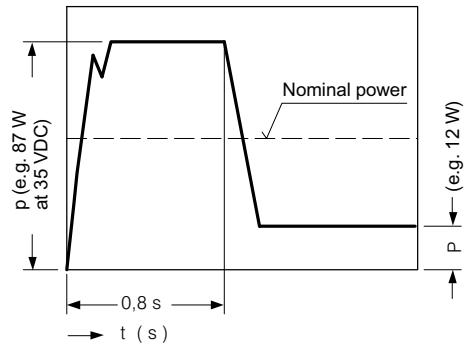
- higher shifting forces
- faster switch-on response

Applications:

- for reliable switching of valves which remain deenergised for long periods.
- in some circumstances, valves which are either too small for the application, or which have solenoids with insufficient power, can still be made to switch reliable by overdriving the solenoid.
  prerequisite: supply voltage must be substantially higher than nominal coil voltage, or nominal coil voltage must be significantly lower than supply voltage. E.g. 12 VDC coil with 24 VDC supply.
- in conjunction with fast-response valves

Example C

Overdriving the coil, then falling below nominal



Switching mode:

- 0.8 secs power input more than nominal
- then a reduction to the holding power

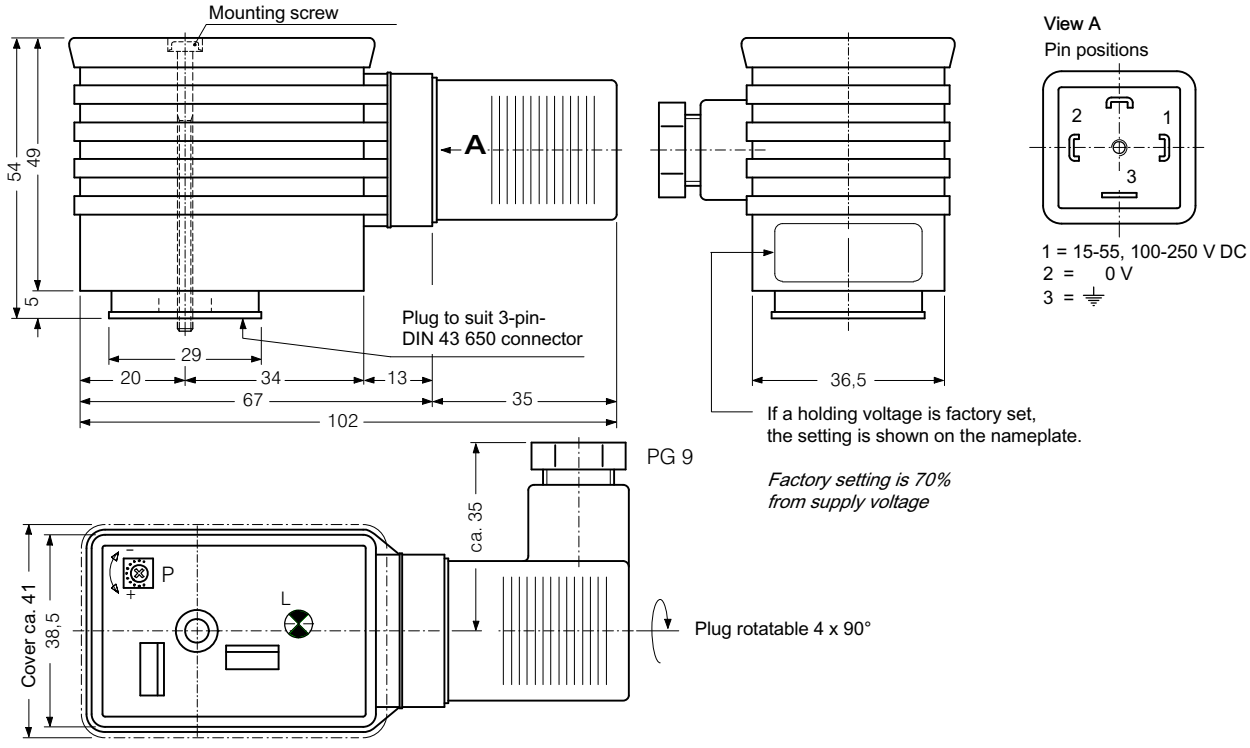
Result:

- higher shifting forces
- cooler-running coils

Applications:

- for reliable switching of valves which remain deenergised for long periods
- limited energy sources (e.g. batteries)
- llike example B, but with the additional benefit of energy-saving “holding” mode
- use only with normal solenoid valves which require less power to hold than to initially shift

5 Dimensions



L = LED glows when power “ON”
P = Potentiometer to set the holding voltage and power

info.ch@bucherhydraulics.com www.bucherhydraulics.com

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