

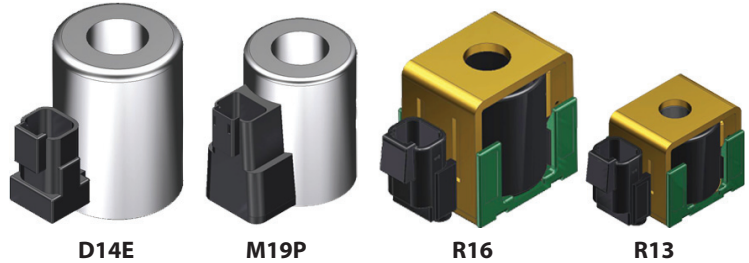
Robust Coils

Comatrol robust coils are specifically designed for harsh operating environments. Compared to standard coils, they have higher tolerances to temperature extremes, voltage spikes, and water ingestion due to power spray, or immersion in water, snow or mud. Typical applications include asphalt machinery, agricultural equipment with chemical and power wash exposure, snow plows and salt-spreader machines, or any application when applying the valves in a hot engine compartment.

Featuring a very compact design, robust coils are smaller than several competing manufacturer's coils, providing more space for other components on the application. In addition, the smaller footprint makes it possible to fit more cartridge valves closer together in the vehicle HIC (Hydraulic Integrated Circuit).

As Comatrol, a member of the Sauer-Danfoss Group, we engineer, manufacture and supply screw-in Cartridge Valves and Hydraulic Integrated Circuits (HIC) to market-leading quality levels. We work closely with our customers around the world to deliver optimal machine control solutions based on their specific needs.

Local Address:



Features

- Four frame sizes - R13, R16, M19P & D14E - providing a Robust Coil option for over 75% of our Solenoid AND Proportional Cartridge Valves
- All Robust coils meet our major OEMs's most stringent requirements for off-highway vehicles
- No O-ring seal is required around coils
- IP69K Environmental Rating for majority of connector options
 - Deutsch, Amp SuperSeal, Metri-Pack 150 Type 2, and Lead Wires
- PLUS+1™ Compliant
 - All coils are designed for installation on machines that utilize Sauer-Danfoss PLUS+1 hardware, ensuring they are compliant out of the box.

R13 & R16:

A Robust option for Comatrol Solenoid Valves and some Proportional Valves

- Available for 08, 09 and 10 Size solenoid or proportional valves
- 4 different DC voltages: 10, 12, 20, 24 VDC
 - Color coded by for easy voltage identification
- Directly interchangeable with the Standard Coils M13 & M16
 - Can field retrofit from Standard to Robust (ensure there is enough spacing between valves)
 - Change to metal nut and remove O-rings
- Now available with bi-directional diodes
 - Protects system's electronics against voltage spikes from the coil
 - Non-polarity dependent, simple installation
- Compact Design
 - R16: Manifold length reduced by 7 mm (0.28") per valve compared to other manufacturer's coils when valves are side by side
- Now available on the PSV10-34 proportional directional valves and PPR09-POD proportional pressure reducing valve

M19P & D14E:

Standard Robust Coils for Comatrol Proportional Valves

- Proportional Flow Control, Proportional Pressure Relieving & Proportional Pressure Reducing Valves
- Special Note: When the R13 & R16 Robust Coils were designed and tested, the existing M19P and D14E coils were also tested and passed the Robust Coil extreme test requirements. Page 2 of this Datasheet will focus on the R13 & R16.

R13 & R16 Robust Coils

Technical Overview

Water Ingression Protection

Robust coils are designed to be highly water and chemical resistant. They have passed comprehensive tests for Salt Fog, Chemical Splash, and Humidity.

Interchangeable with Standard M13 & M16

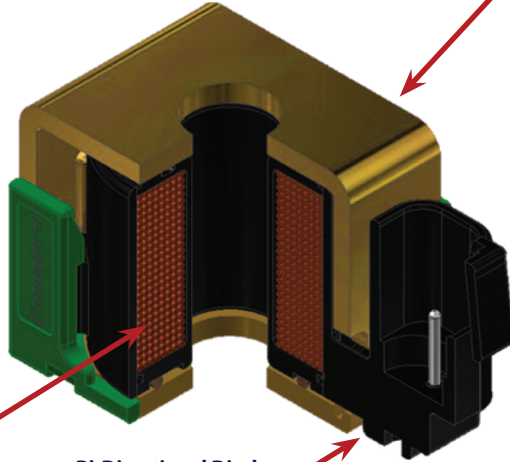
Can field retrofit from Standard to Robust, providing there is adequate space between the valves on the manifold. Add the metal nut and remove the O-rings.

Fully Encapsulated Windings

The coil is designed with a protective layer of encapsulated plastic. A special molding technique prevents moisture build-up while the plastic is applied.

No O-Rings Needed

For ease of installation, Robust coils do not need coil O-rings.



Protective Metal Casing

The metal exterior casing protects against dramatic temperature changes and physical damage to the coil. Robust coils have passed the drop test, vibration test, and the mechanical shock test.

IP69K with Integral Connectors

Robust coils with Deutsch, Amp SuperSeal, Lead Wires and Metri-Pack 150 Type 2 are environmentally rated IP69K.

Bi-Directional Diodes

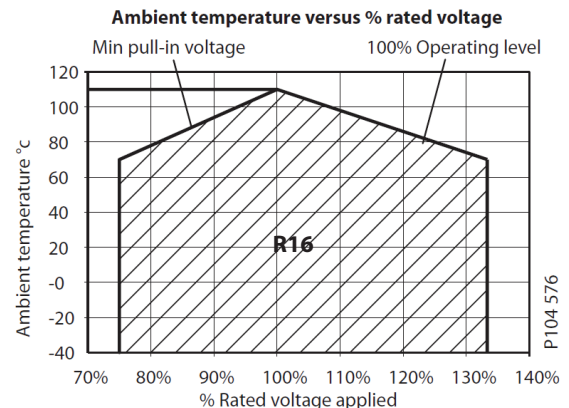
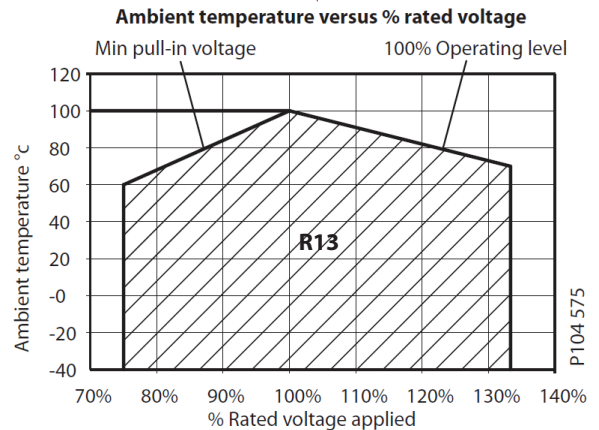
New! Now available with all connectors options. The new bi-directional TVS diode is not polarity-dependent and therefore does not require the alignment of the coil terminals during installation which will mistake proof electrical installations.

High Input Voltage Tolerance

Robust coils are rated for 75% to 133% of nominal.

Electrical Specifications

Voltage (V)	Model	10 VDC	12 VDC	20 VDC	24 VDC
Watts (W)	M13	16 Watt	16 Watt	16 Watt	16 Watt
	M16	20 Watt	20 Watt	20 Watt	20 Watt
	D14E	30 Watt	30 Watt	30 Watt	30 Watt
	D14E (35W)		35 Watt		35 Watt
	M19P		22 Watt		22 Watt
Resistance (Ohms) @ 20C (72F)	M13	6.2	9	25	36
	M16	4.8	6.9	20	28
	D14E	3.3	4.8	13	19
	D14E (35W)		4.1		17
	M19P		3.7		16
Current draw (A) @ 20C (72F)	M13	1.62	1.34	0.81	0.67
	M16	2.08	1.74	1.01	0.85
	D14E	3	2.5	1.5	1.25
	D14E (35W)		1.8		0.9
	M19P		1.8		0.9
Housing Color		Green	Gray	Blue	Yellow



Ordering Information

R13 - 10D - 16W - DE - DB

Robust Coil
 13 mm outer diameter **R13**
 20 mm outer diameter **R16**

Voltage
 10 VDC **10D**
 12 VDC **12D**
 20 VDC **20D**
 24 VDC **24D**

Power (W)
 16 Watt (R13 Only) **16W**
 20 Watt (R16 Only) **20W**

Bi-Directional Diode
 No Diode **Omit DB**
 Diode, Bi-directional

Coil Termination	Code	IP Rating
AMP SuperSeal 1.5	AS	IP69K
Deutsch	DE	IP69K
Metri-Pack 150, Type 2	M3	IP69K
Flying Leads	FL	IP69K