



**SmartGen**  
ideas for power

**GENSET PARALLEL UNIT**

**PARALLEL SCHEME**

SmartGen

**SMARTGEN (ZHENGZHOU) TECHNOLOGY CO., LTD.**



Chinese trademark

**SmartGen** English trademark

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**Table 1 - Version History**

Date	Version	Contents
2014-08-12	1.0	Original release.
2020-02-14	2.0	This article is changed to suit all genset parallel controllers of the company; For central voltage and range voltage description, corresponded tables are changed to formula. Added description for General J1939 ECU engine.

This scheme suits all genset parallel controllers of the company.

**Table 2 - Sign Illustration**

Sign	Illustration
 NOTE	Highlights an essential element of a procedure to ensure correctness.
 CAUTION	Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.
 WARNING	Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly.

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**1 GOV/AVR CONTROL DESCRIPTION**

Engine speed and motor voltage can be adjusted by DC voltage output of module. Control voltages needed for different genset GOV and AVR are different, so correct central voltage and range voltage for module GOV and AVR must be set to match with them.

**1.1 GOV/AVR PARAMETER SETTINGS**

**Table 3 - GOV/AVR Parameter Settings**

Interface	Item	Function
GOV	Center (SW1)	Control the center voltage by setting the GOV voltage.
	Range (SW2)	Control the bias voltage range by setting the GOV voltage.
	Output Reverse	When GOV control voltage rise, the speed of engine drop, enabled output reverse.
AVR	Center (SW1)	Control the center voltage by setting the AVR voltage.
	Range (SW2)	Control the bias voltage range by setting the AVR voltage.
	Output Reverse	When AVR control voltage rise, the voltage of generator drop, enabled output reverse.

Formula for SW1 set value and center voltage:

Center voltage (V) = Set value \* 0.5;

For example: if set value =1.0 or 1.00, then center voltage =0.5V (1.0\*0.5);

if set value =5.0 or 5.00, then center voltage =2.5V (5.0\*0.5);

Formula for SW2 set value and range voltage:

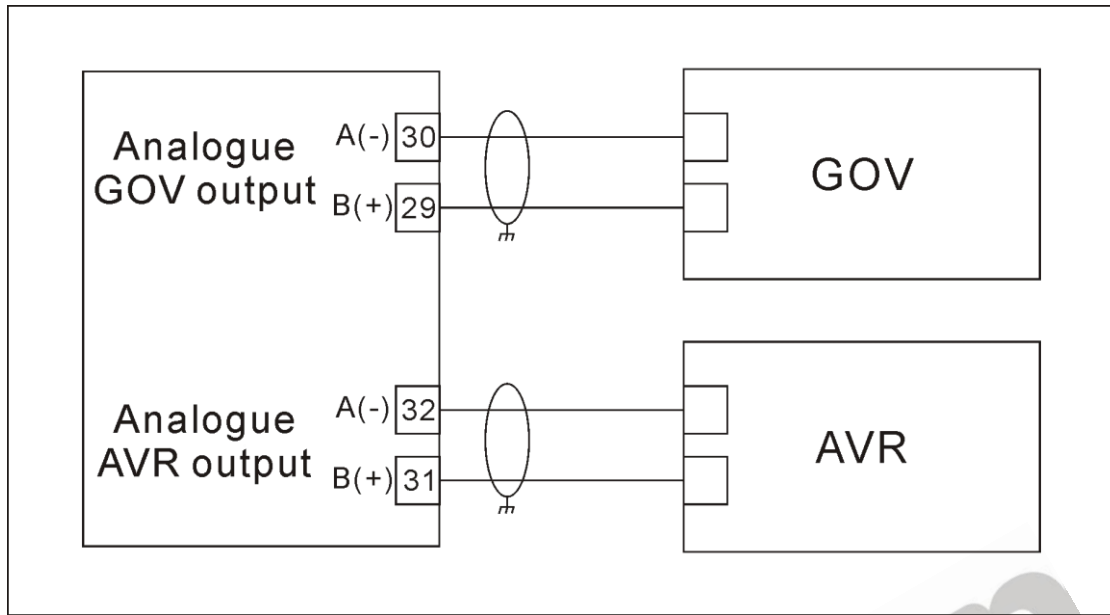
Range voltage (±V) = Set value\*0.5+0.5;

For example: if set value is 1.0 or 1.00, then range voltage is ±1.0V (1.0\*0.5+0.5);

if set value is 5.0 or 5.00, then range center voltage is ±3.0V (5.0\*0.5+0.5).



**1.2 GOV, AVR CONNECTION**



**Fig. 1 - GOV/AVR Connection Diagram**

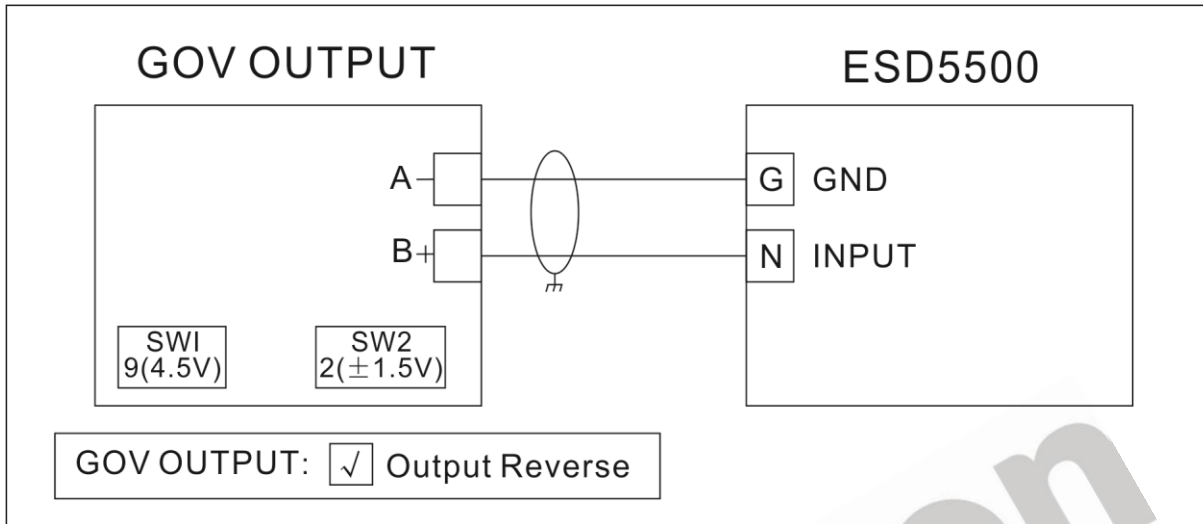
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**2 GOV WIRING**

**2.1 GAC GOV**

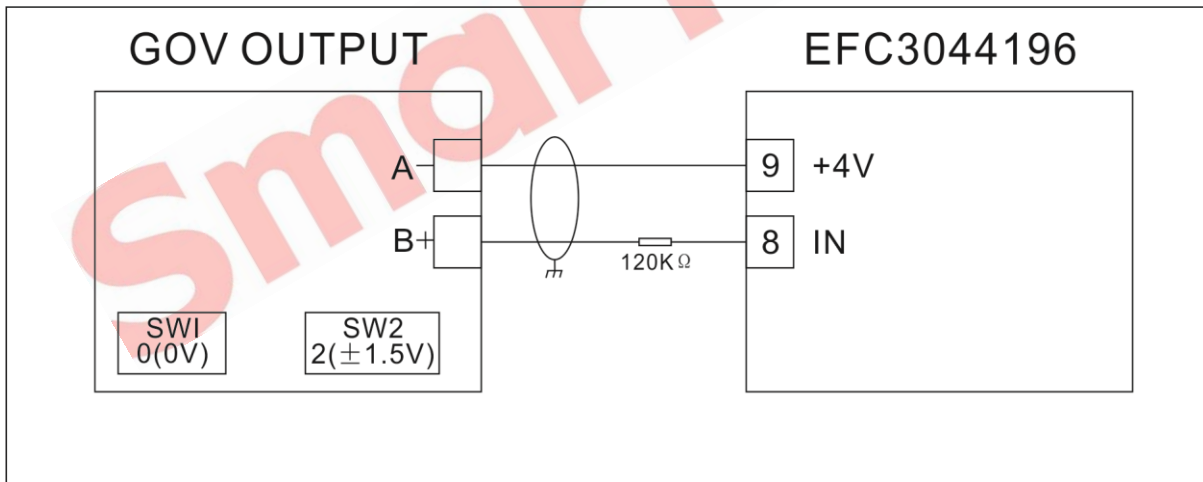
**2.1.1 5100-5500 SERIES**



**Fig. 2 - ESD5500 Connection Diagram**

**2.2 CUMMINS**

**2.2.1 EFC\* SERIES**



**Fig. 3 - EFC3044196 Connection Diagram**

2.2.2 EFC ILS

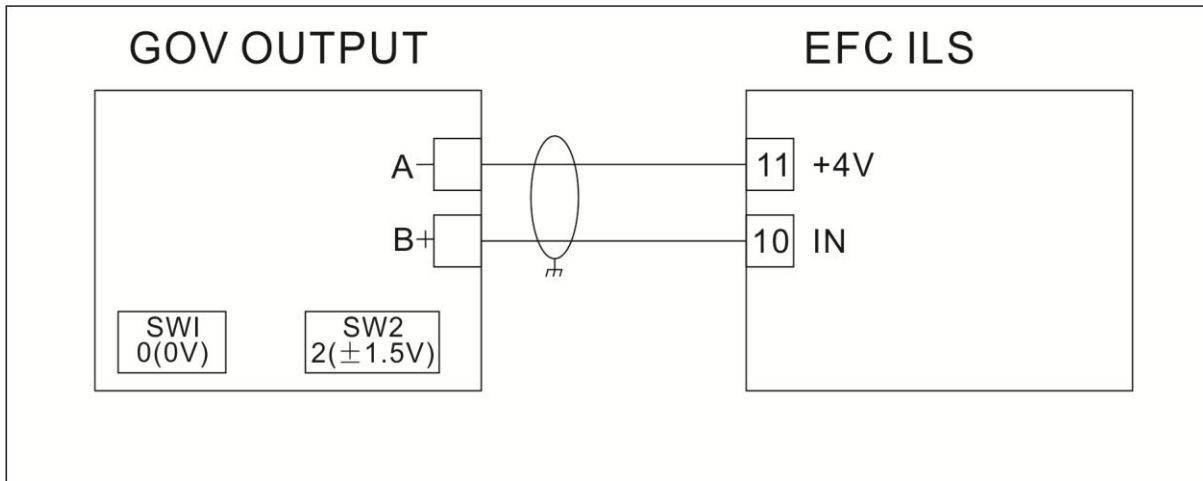


Fig. 4 - EFC ILS Connection Diagram

2.3 VOLVO

2.3.1 EMS2

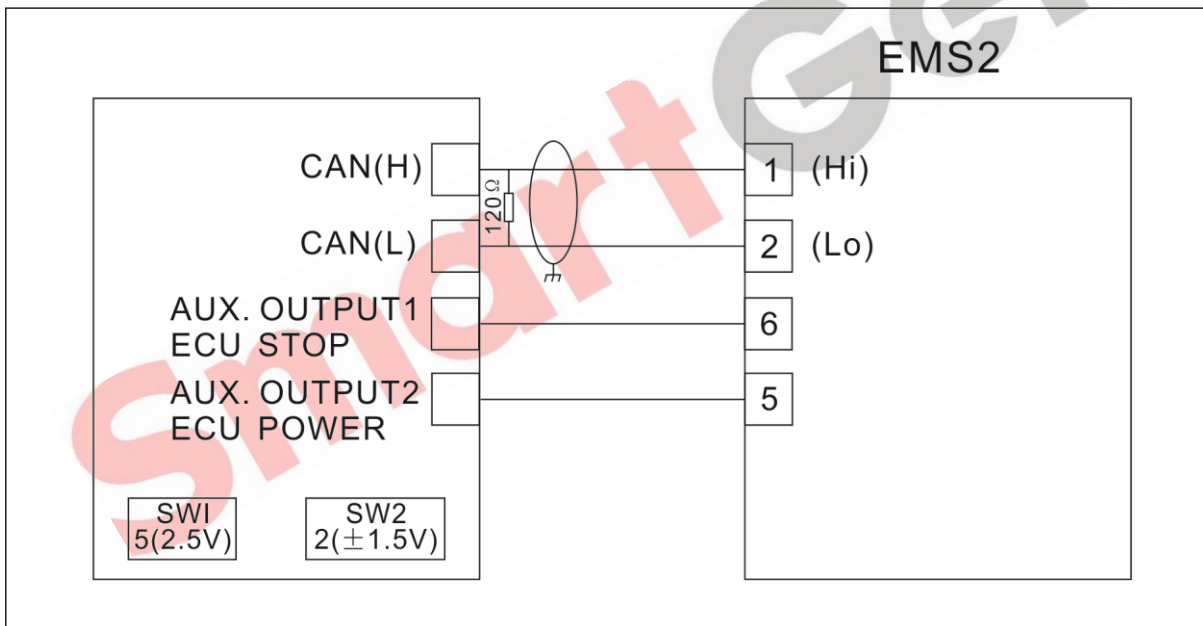


Fig. 5 - EMS2 Connection Diagram

2.3.2 EDC3

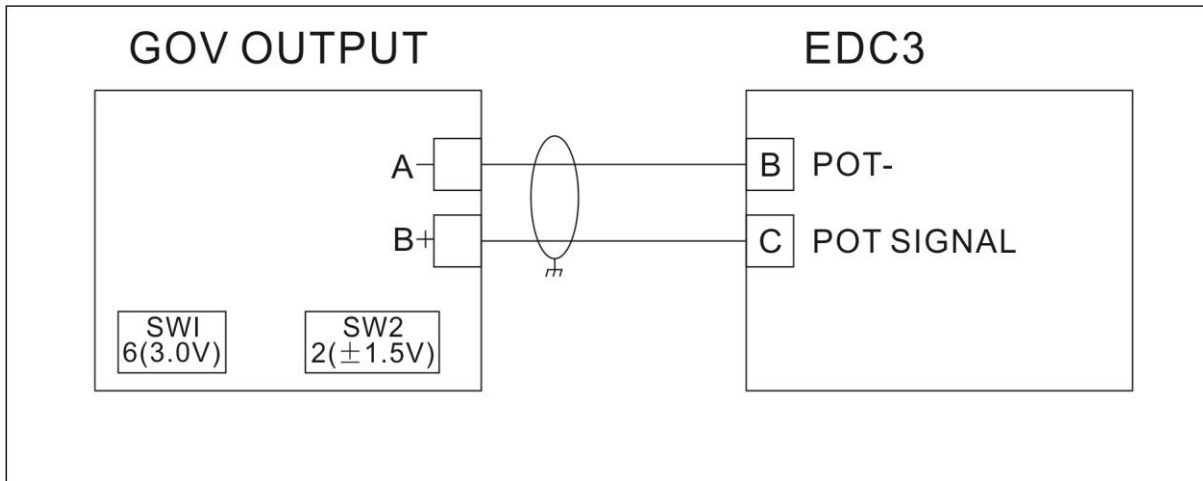


Fig. 6 - EDC3 Connection Diagram

2.4 PERKINS

2.4.1 2000 SERIES

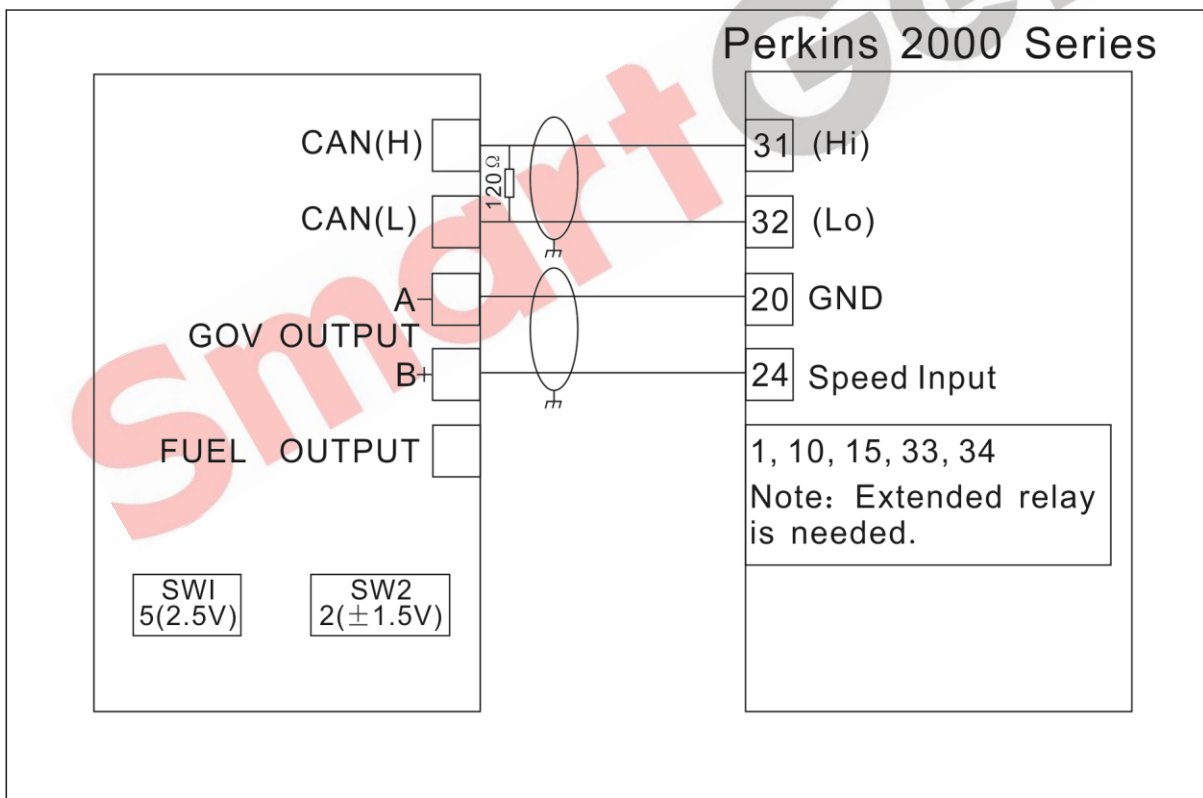
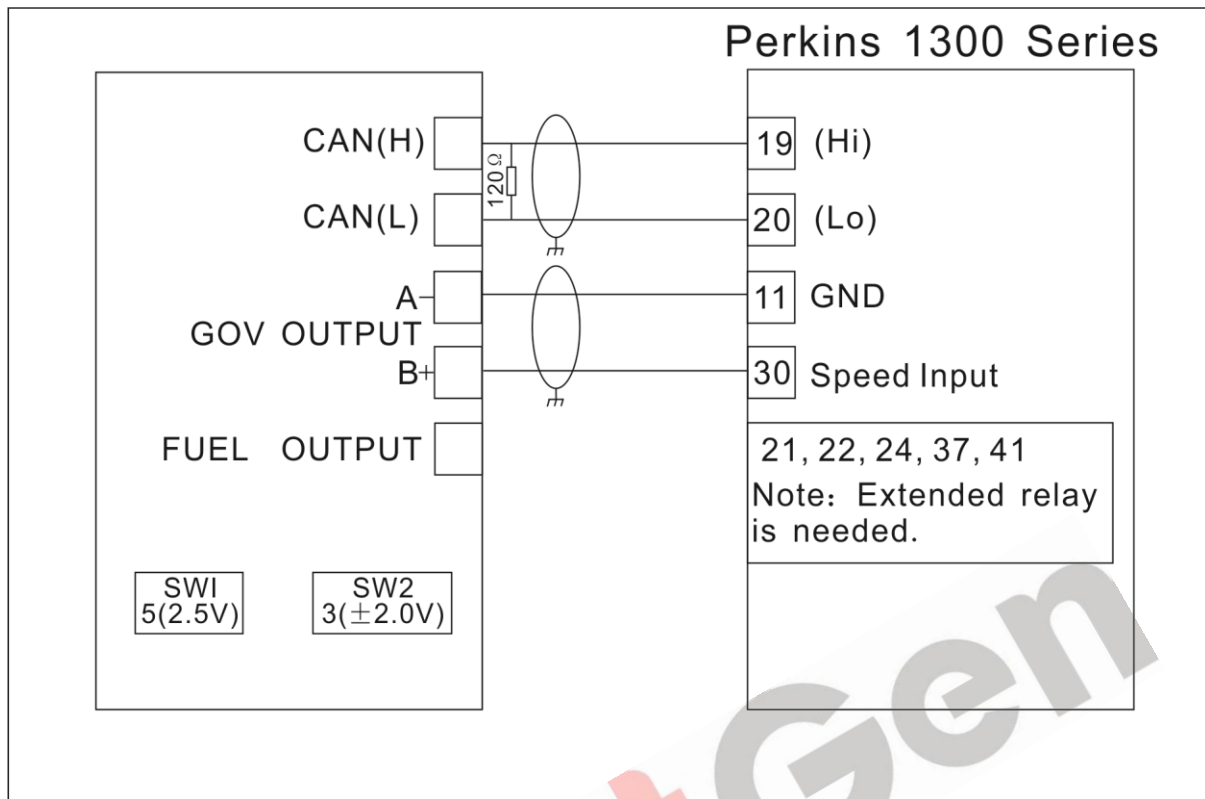


Fig. 7 - Perkins 2000 Series Connection Diagram

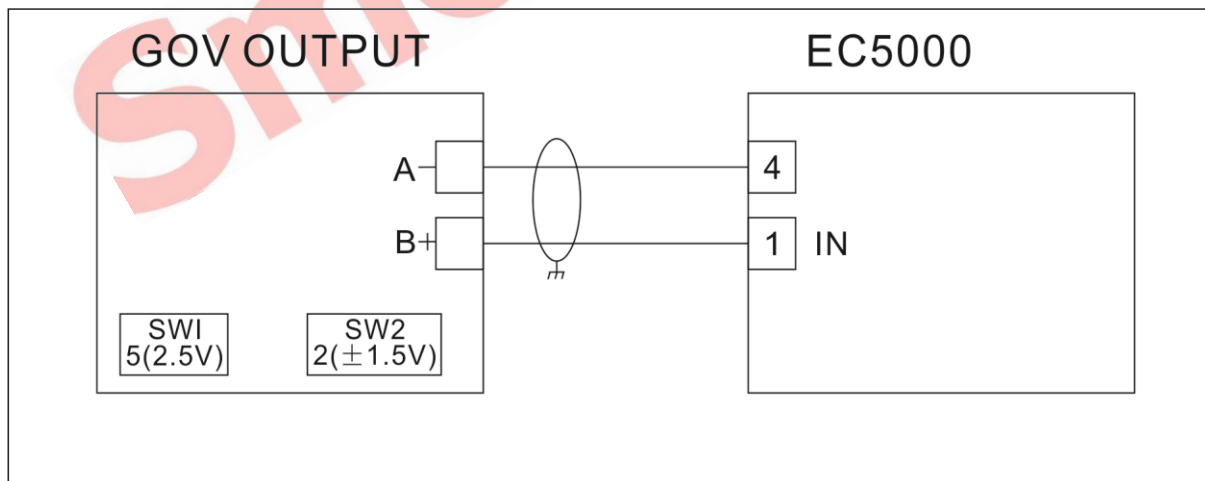
**2.4.2 1300 SERIES ENGINE**



**Fig. 8 - Perkins 1300 Series Connection Diagram**

**2.5 AMBAC**

**2.5.1 EC5000\*/ EC5100\*/ EC5110\***



**Fig. 9 - EC5000 Connection Diagram**

2.5.2 CW673C

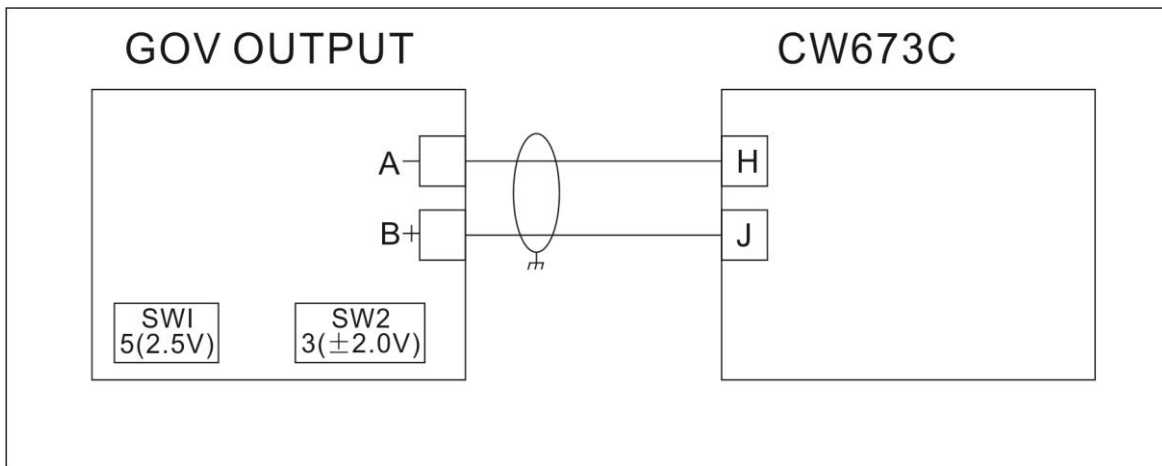


Fig.10 - CW673C Connection Diagram

2.6 BARBER COLMAN

2.6.1 DYN1 10502/10503/10504/10506

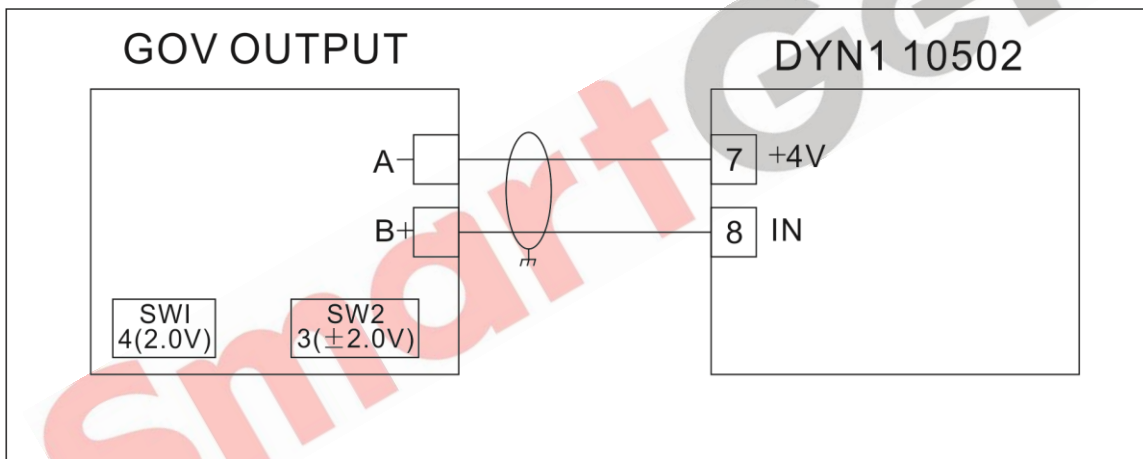


Fig. 11 - DYN1 10502 Connection Diagram

2.6.2 DYN1 10693/10694/10695/10752/10753/107514/10756

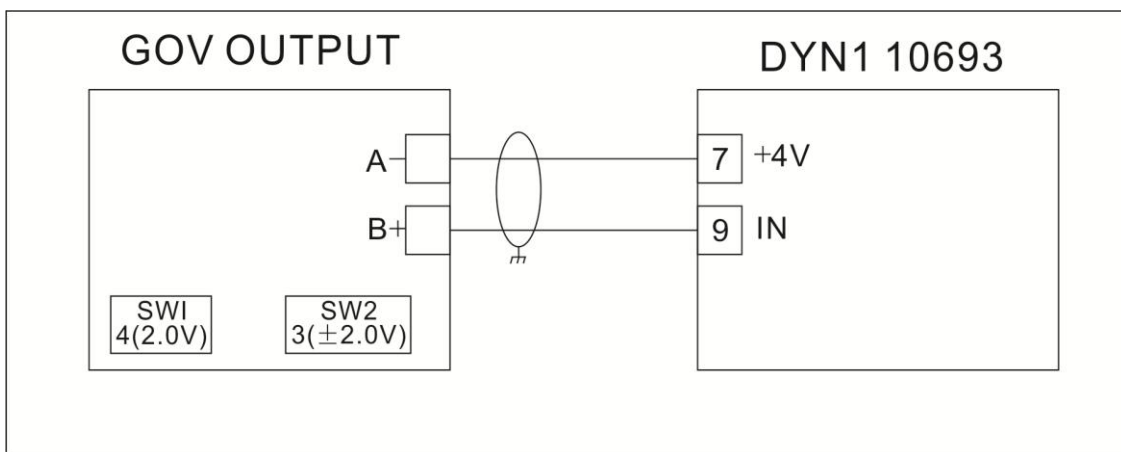


Fig. 12 - DYN1 10693 Connection Diagram

2.6.3 DYN1 10794\*

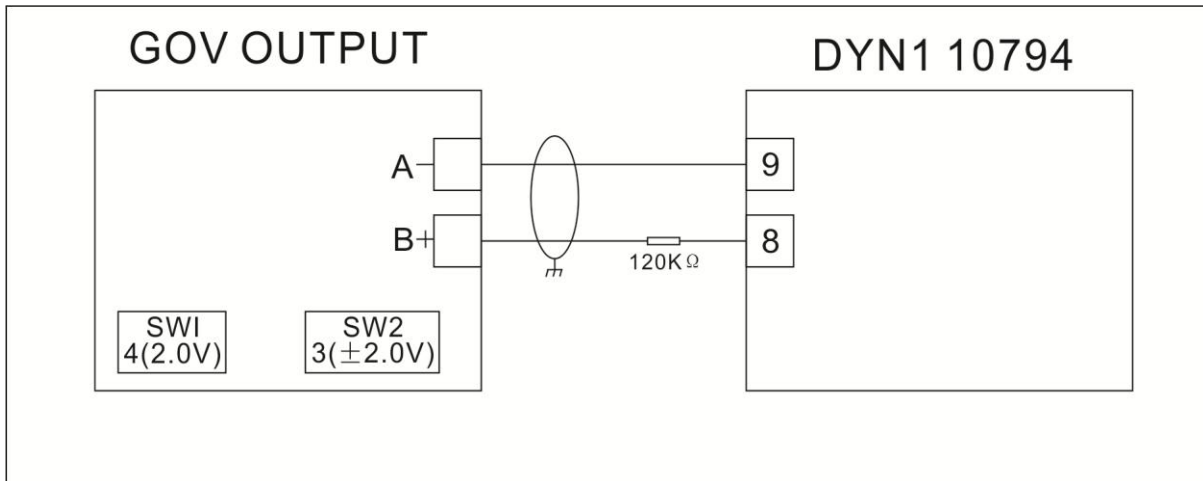


Fig. 13 - DYN1 10794 Connection Diagram

2.6.4 DYN1 10871

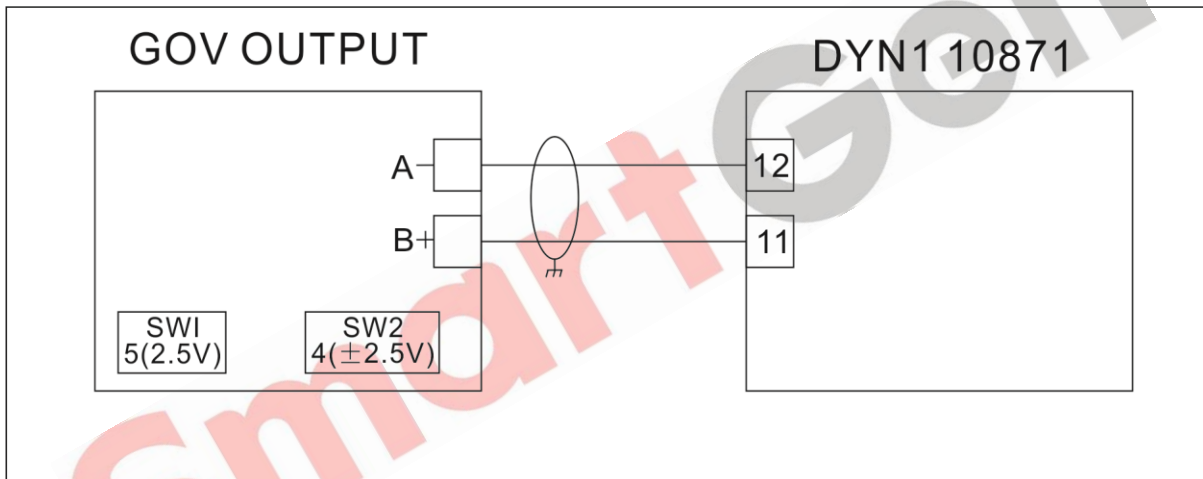


Fig. 14 - DYN1 10871 Connection Diagram

2.6.5 DPG 2201\*

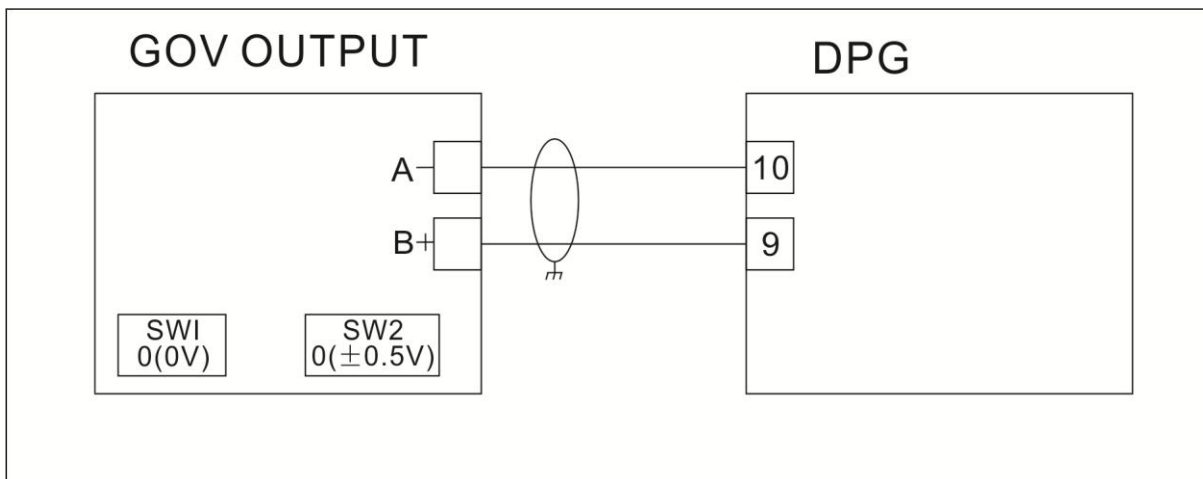


Fig. 15 - DPG 2201\* Connection Diagram

2.6.6 DPG 2401

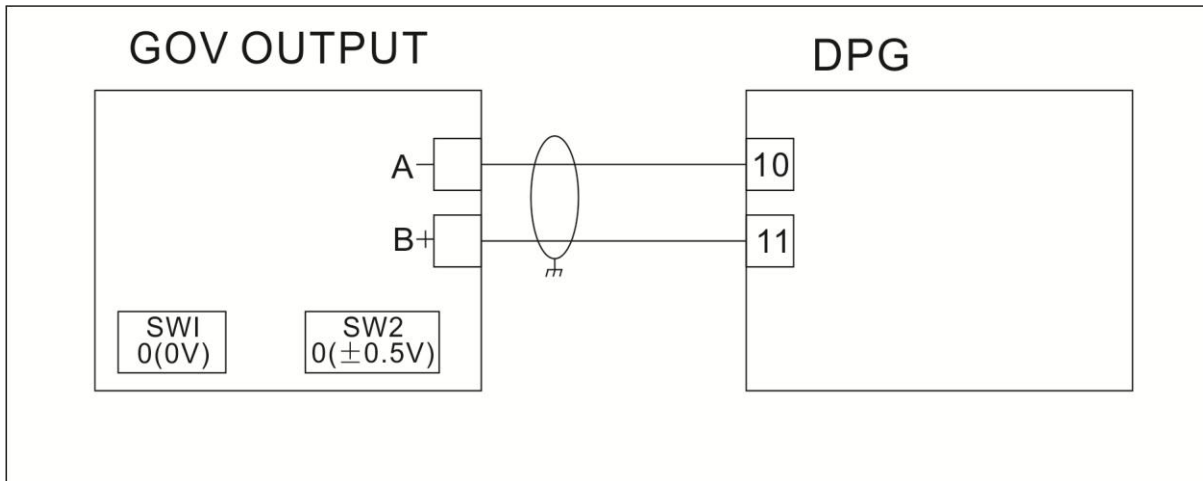


Fig.16 - DPG 2401 Connection Diagram

2.6.7 DYNA 8000\*

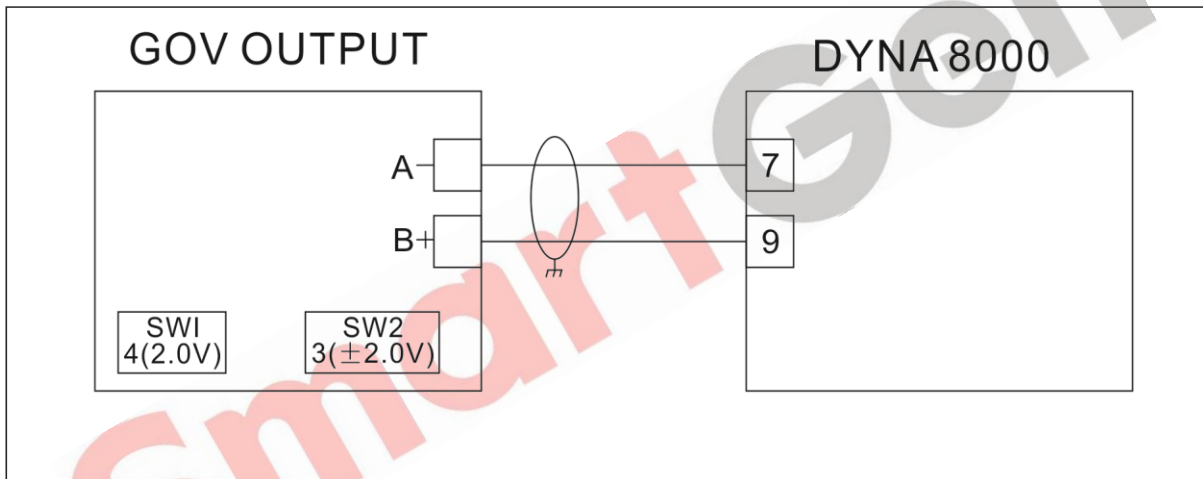
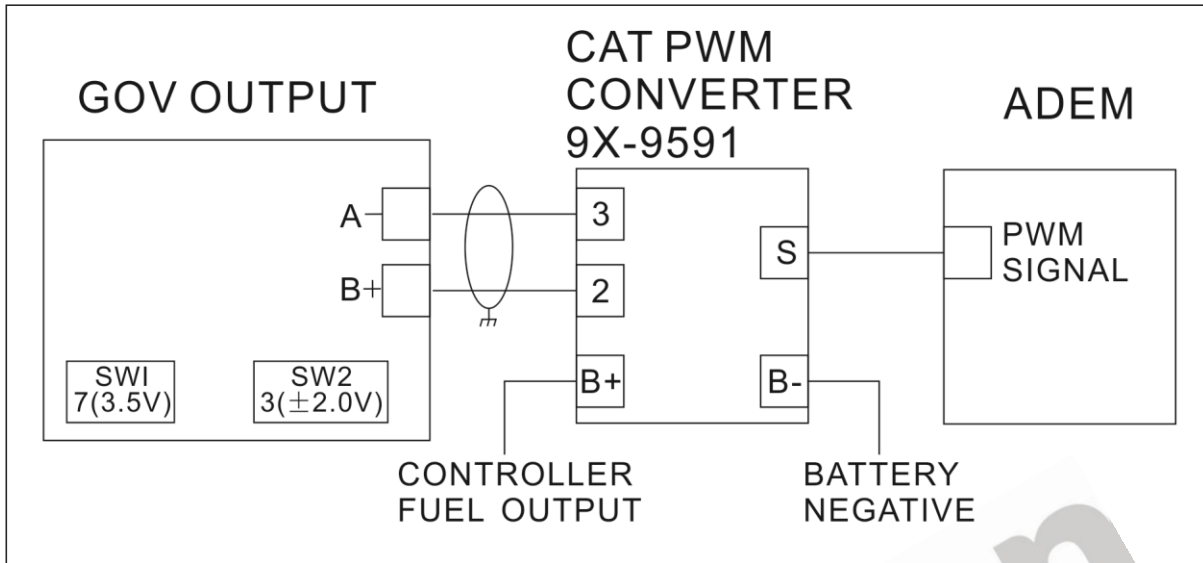


Fig. 17 - DYNA 8000 Connection Diagram

**2.7 CATERPILLAR**

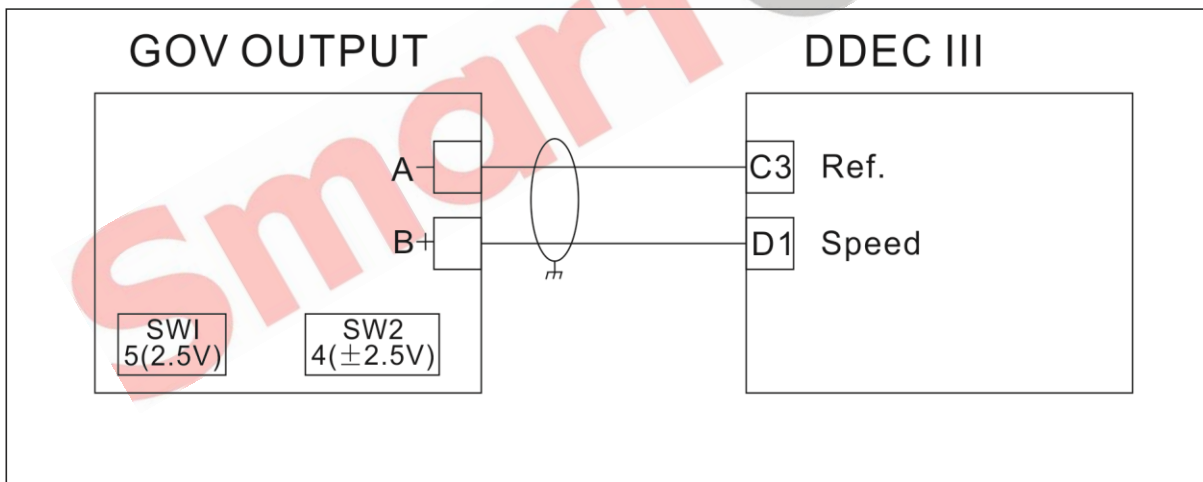
**2.7.1 ADEM\***



**Fig.18 - ADEM Connection Diagram**

**2.8 DETROIT**

**2.8.1 DDEC III**



**Fig.19 - DDEC III Connection Diagram**



2.8.2 DDEC IV\*

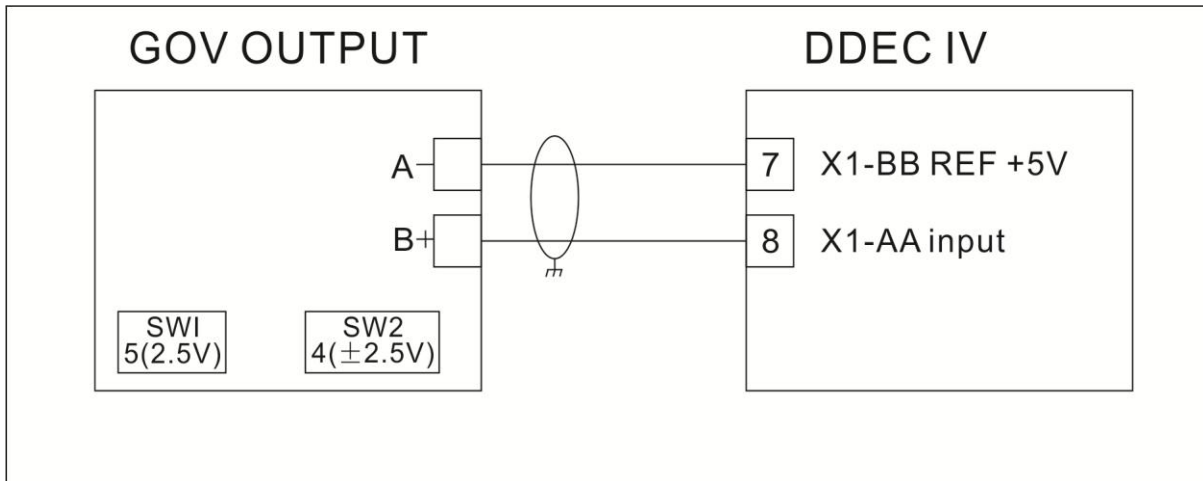


Fig. 20 - DDEC IV Connection Diagram

2.9 DEUTZ

2.9.1 EMR2

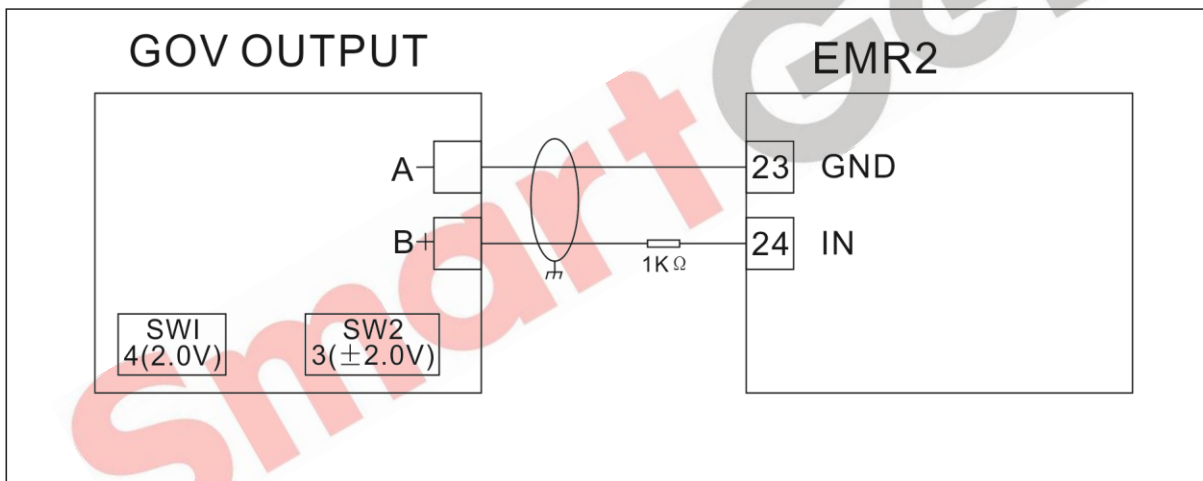
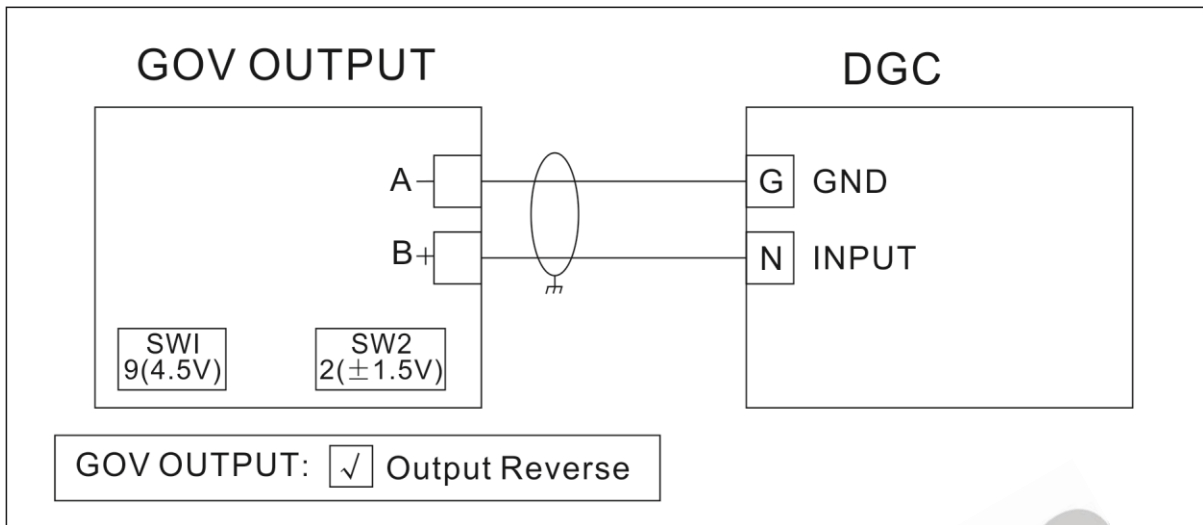


Fig. 21 - EMR2 Connection Diagram

**2.10 DOOSAN**

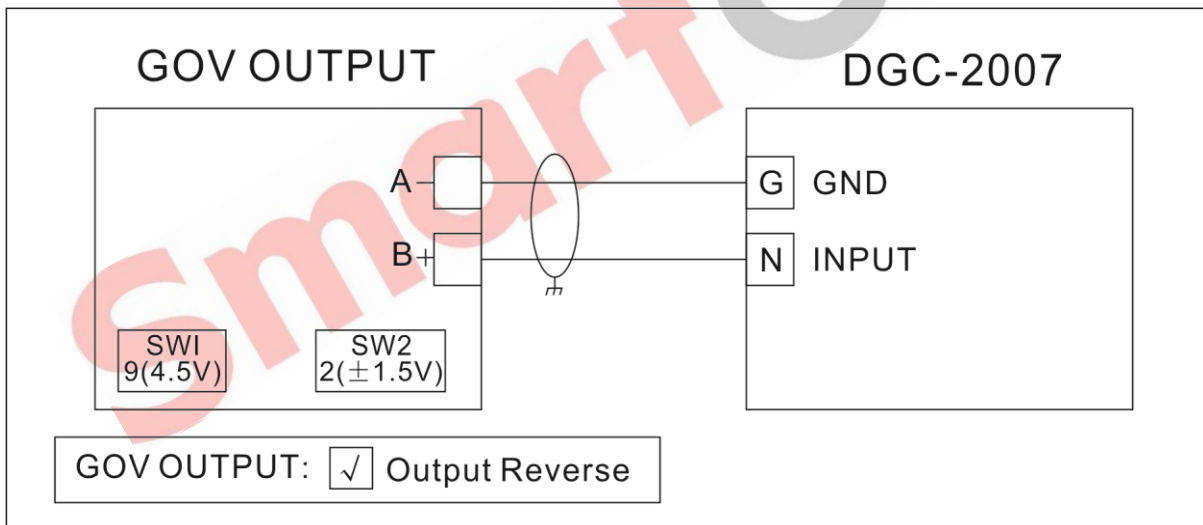
**2.10.1 DGC**



**Fig. 22 - DGC Connection Diagram**

**2.11 GHANA CONTROL**

**2.11.1 DGC-2007\***



**Fig. 23 - DGC-2007 Connection Diagram**

2.12 HEINZMANN

2.12.1 KG SERIES

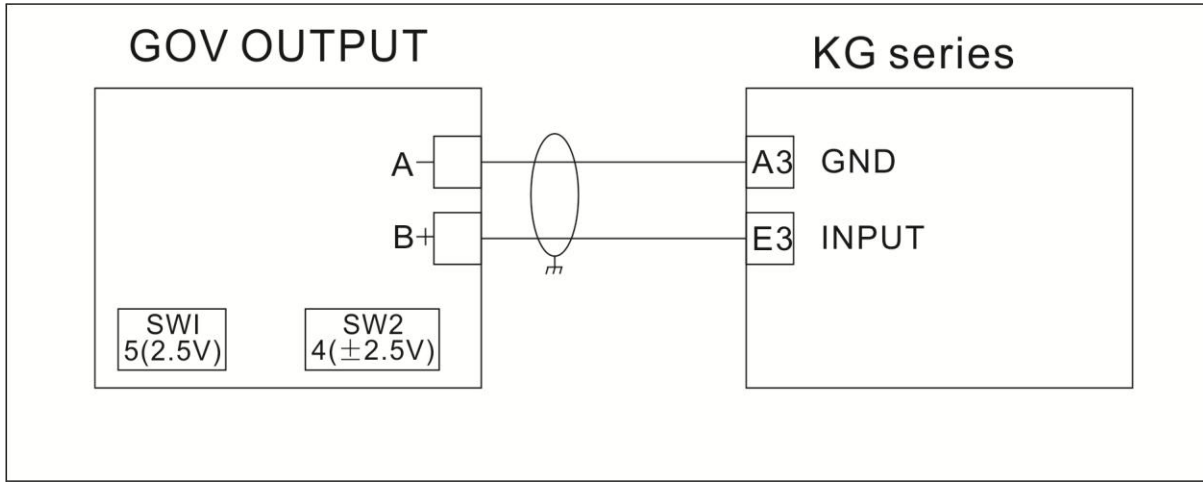


Fig. 24 - KG Series Connection Diagram

2.12.2 PANDAROS\*

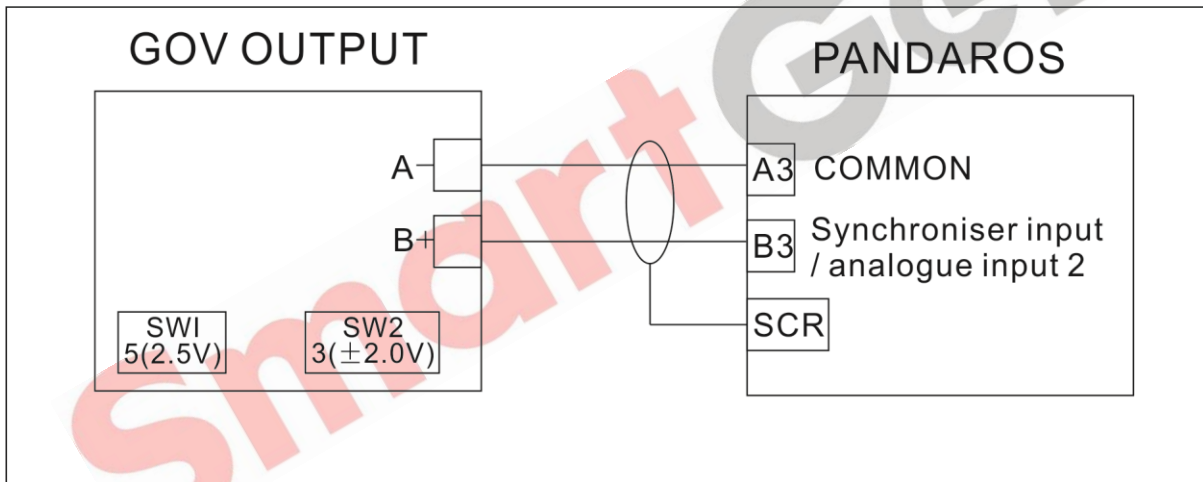


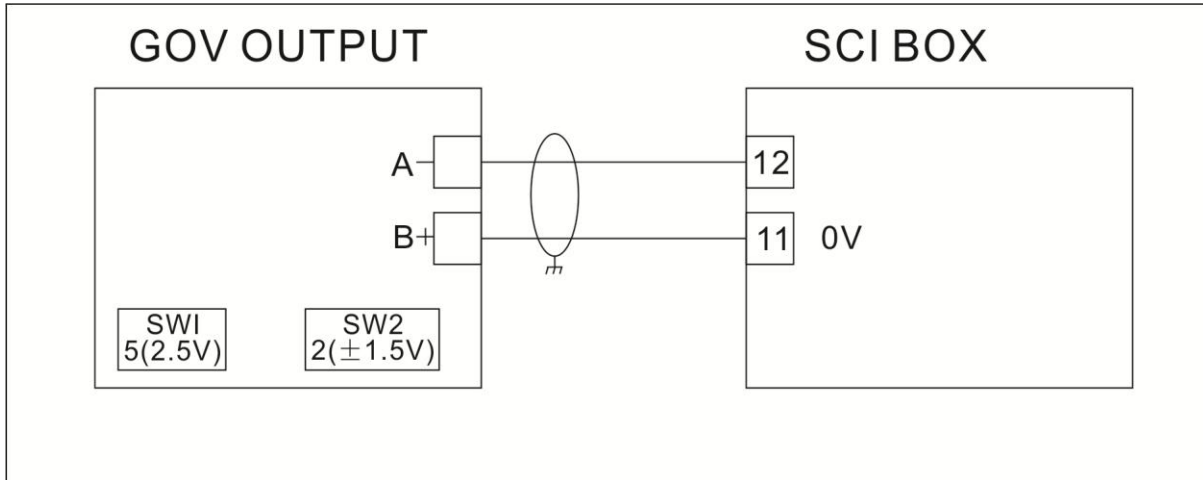
Fig. 25 - PSNDSROS Connection Diagram

**NOTE:** Pandaros is configurable by using “Pandaros Packager”:

- Single / Parallel generator (other) no droop;
- Analogue input 1 (load share) disabled;
- Analogue input 2 (sync input) configured to 0-5V input.

**2.13 IVECO**

**2.13.1 CURSOR 13TE2 (WITH SCI BOX)\***



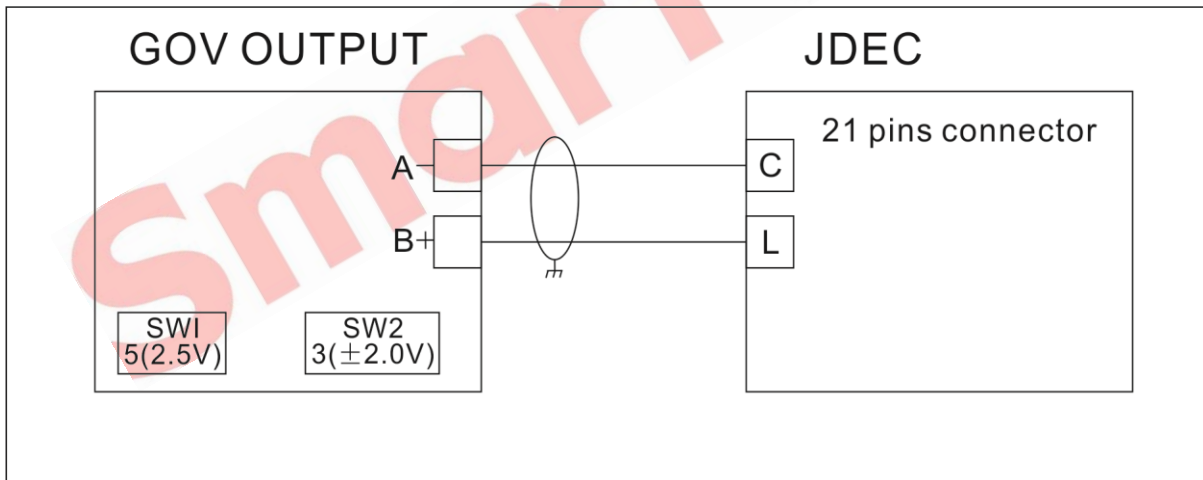
**Fig. 26 - SCI BOX Connection Diagram**

**NOTE:** The dip switches on the SCI box are set as below:

1=OFF, 2=ON, 3=OFF, 4=OFF.

**2.14 JOHN DEERE**

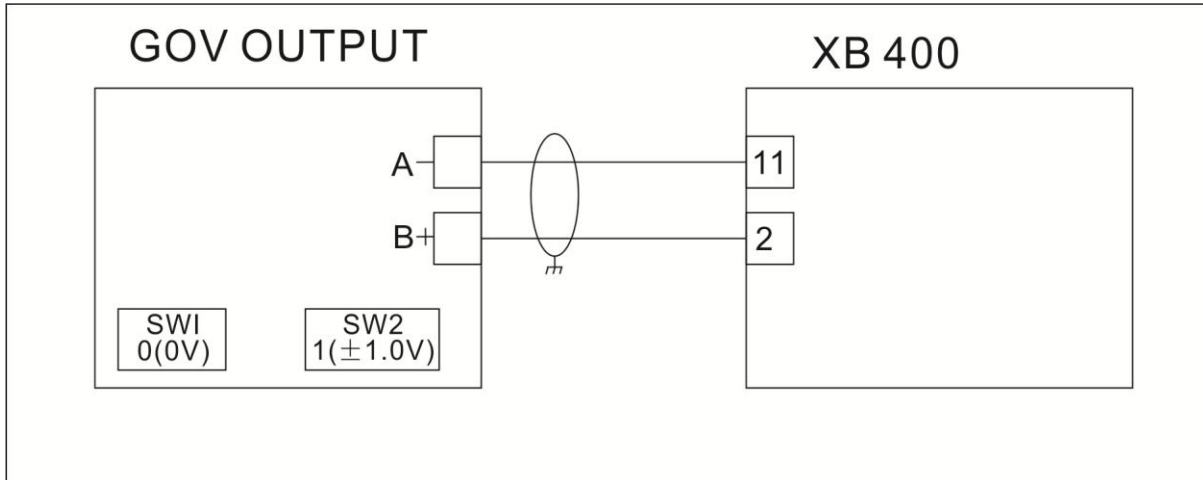
**2.14.1 JDEC**



**Fig. 27 - JDEC Connection Diagram**

**2.15 MITSUBISHI**

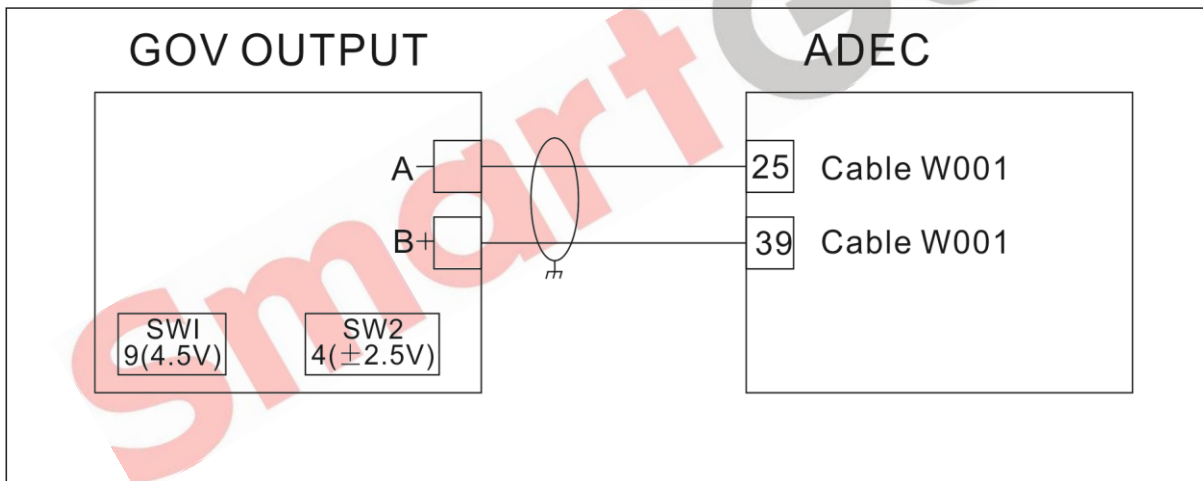
**2.15.1 XB400\***



**Fig. 28 - XB 400 Connection Diagram**

**2.16 MTU**

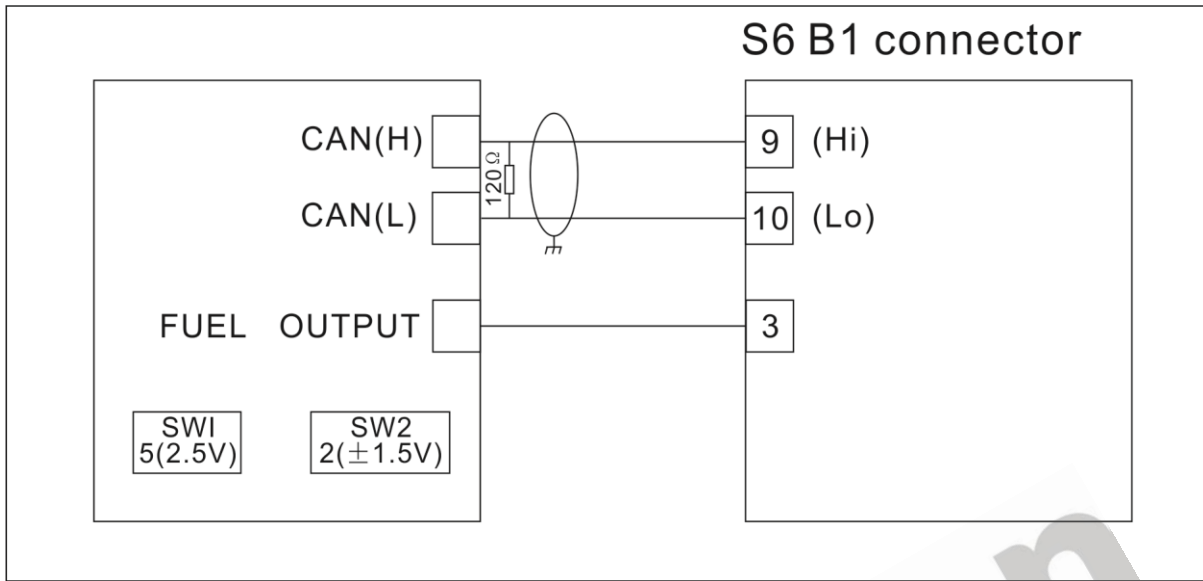
**2.16.1 ADEC2000\*/4000**



**Fig. 29 - ADEC Connection Diagram**

**2.17SCANIA**

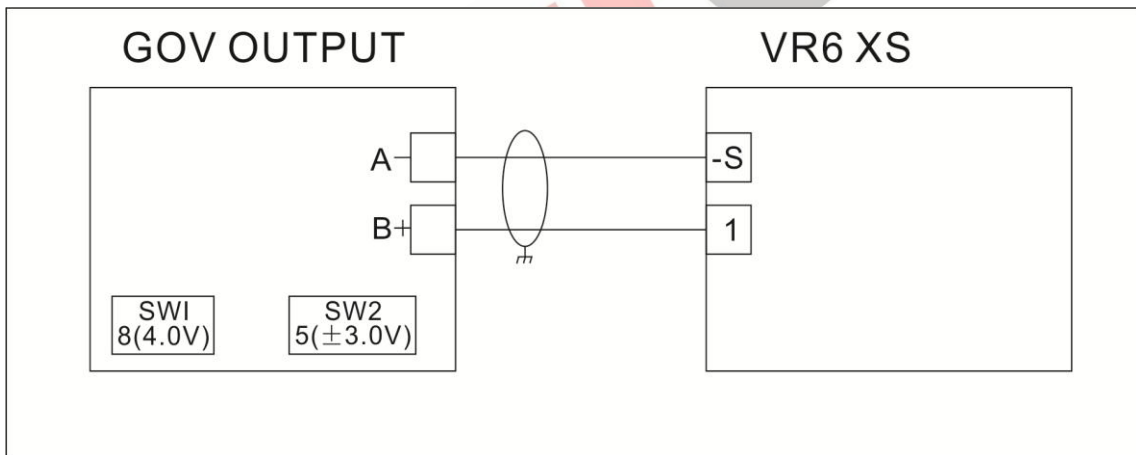
**2.17.1 S6 SERIES**



**Fig. 30 - S6 Connection Diagram**

**2.18TOHO**

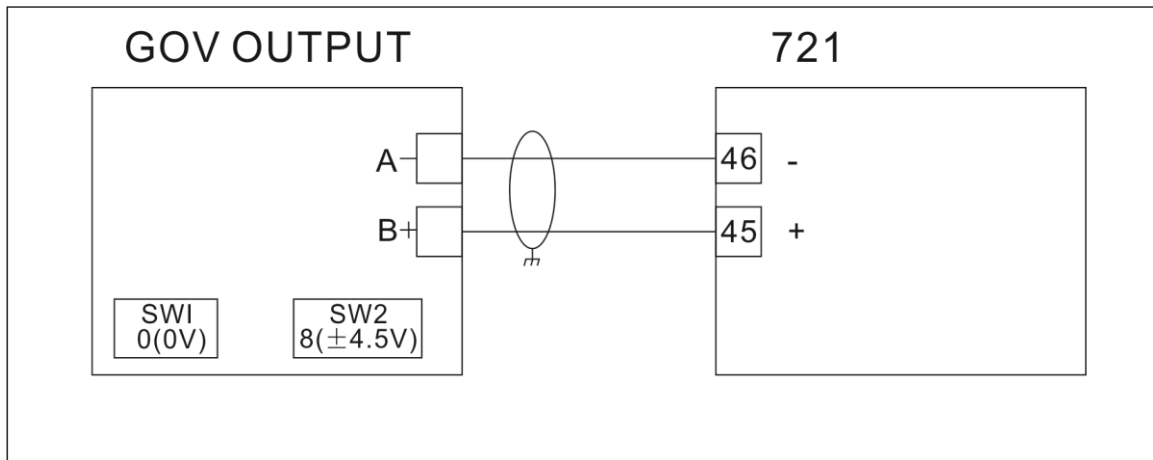
**2.18.1 TOHO XS\***



**Fig. 31 - VR6 XS Connection Diagram**

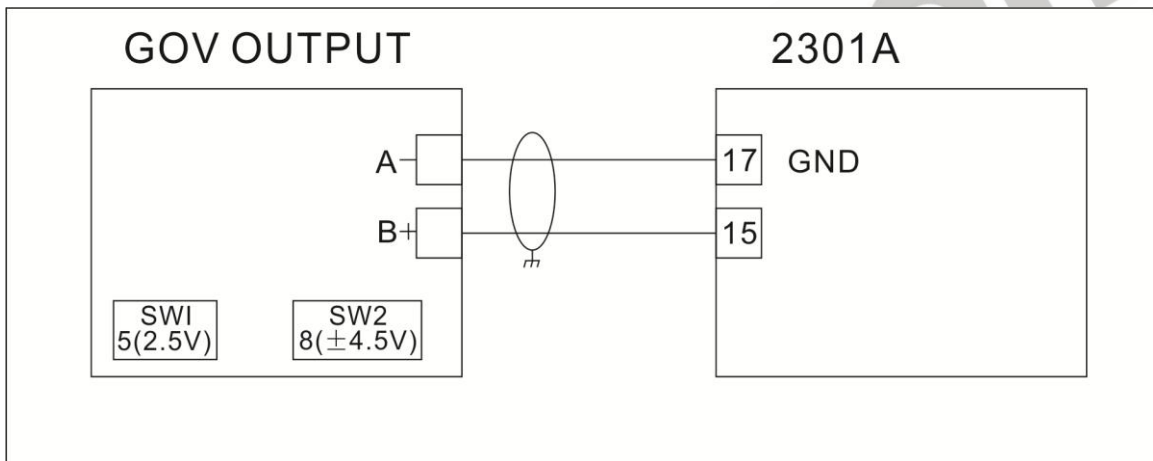
**2.19 WOODWARD**

**2.19.1 721 DIGITAL SPEED CONTROL**



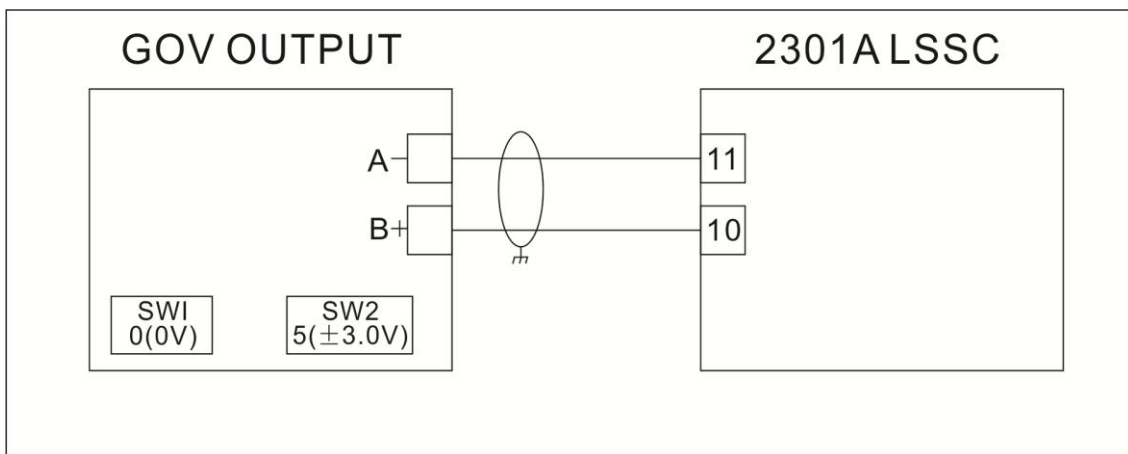
**Fig. 32 - 721 Digital Speed Control Connection Diagram**

**2.19.2 2301A SPEED CONTROL\***



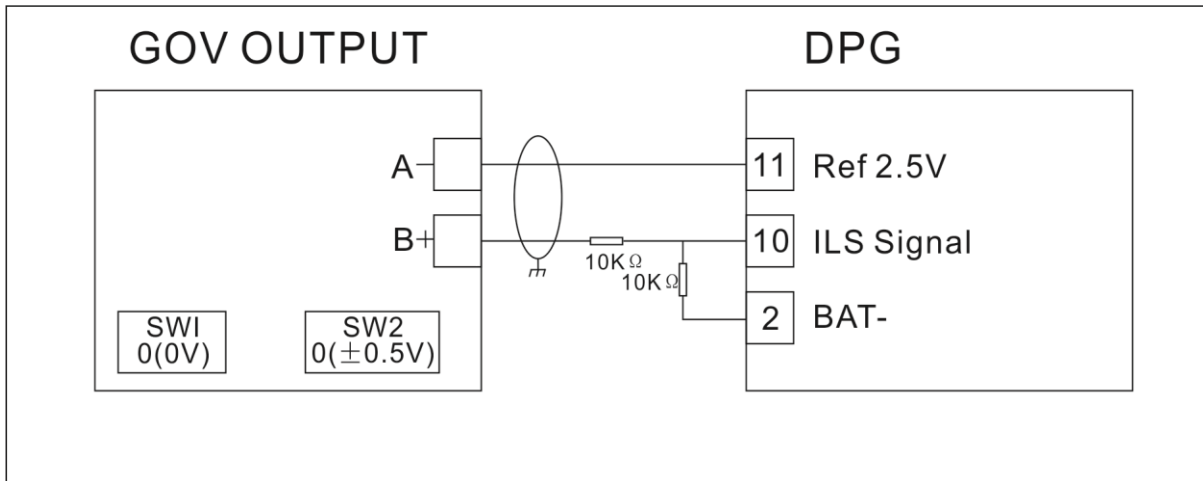
**Fig. 33 - 2301A Connection Diagram**

**2.19.3 2301A LSSC LOAD SHARE**



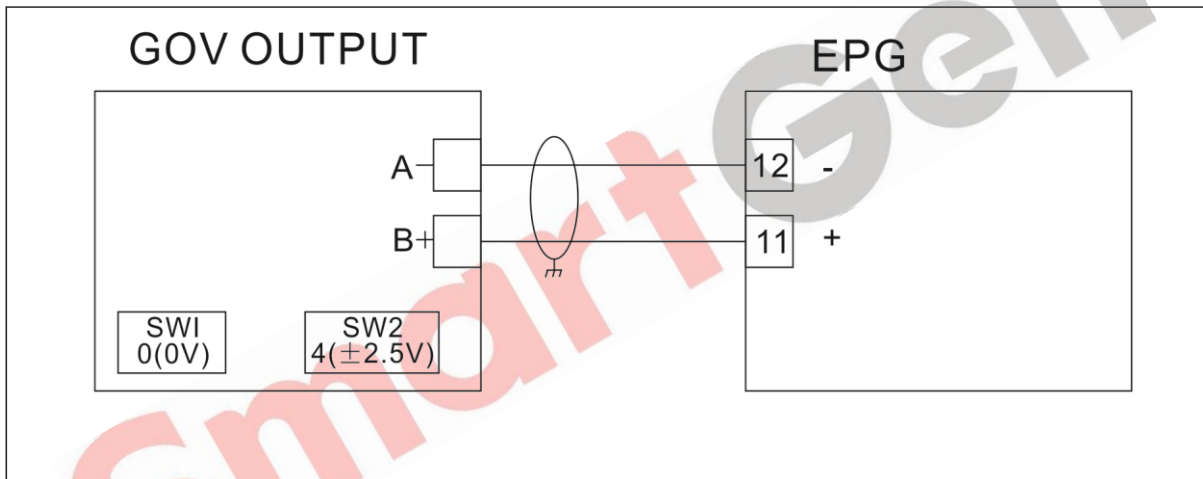
**Fig. 34 - 2301A LSSC Connection Diagram**

**2.19.4 DPG**



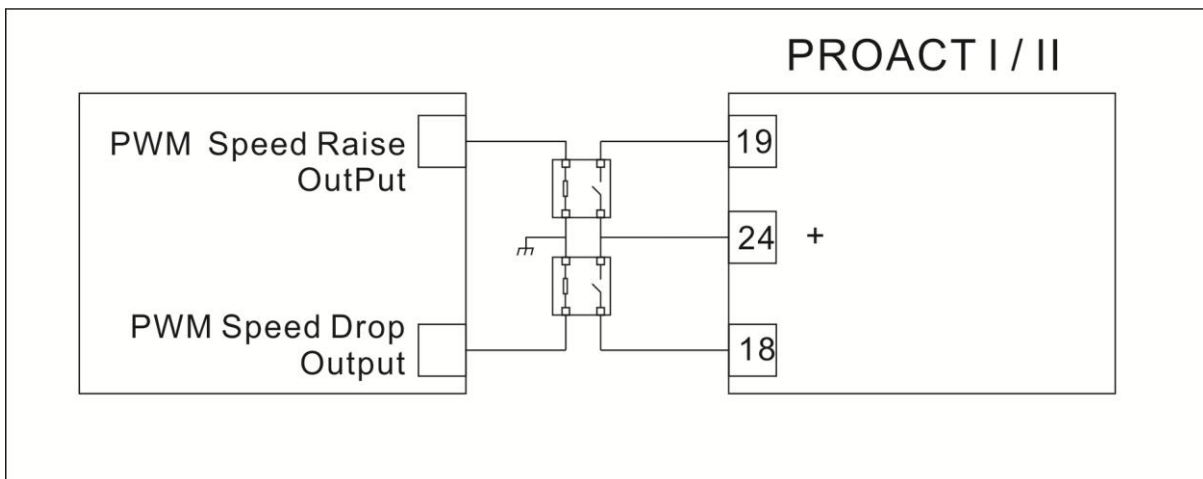
**Fig. 35 - DPG Connection Diagram**

**2.19.5 EPG (ELECTRICALLY POWERED GOVERNORS)\***



**Fig. 36 - EPG Connection Diagram**

**2.19.6 PROACT I / II**

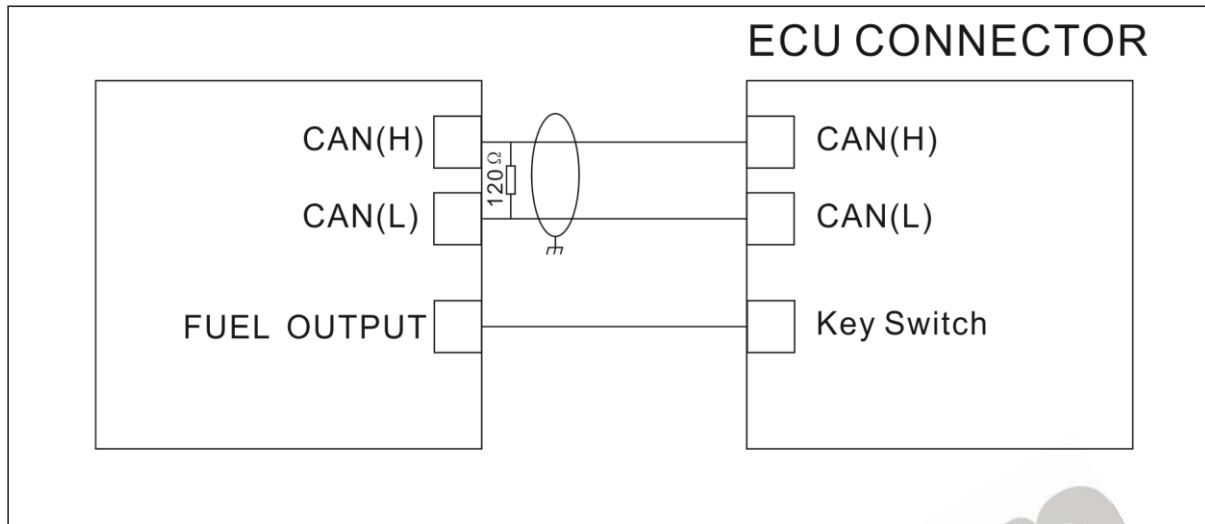


**Fig. 37 - PROACT I/II Connection Diagram**



## 2.20 General J1939 ECU ENGINE

### 2.20.1 General J1939 ECU (GTSC1)



**Fig. 38 - General ECU Connection Diagram**

**NOTE:** SW1/SW2 settings are as below:

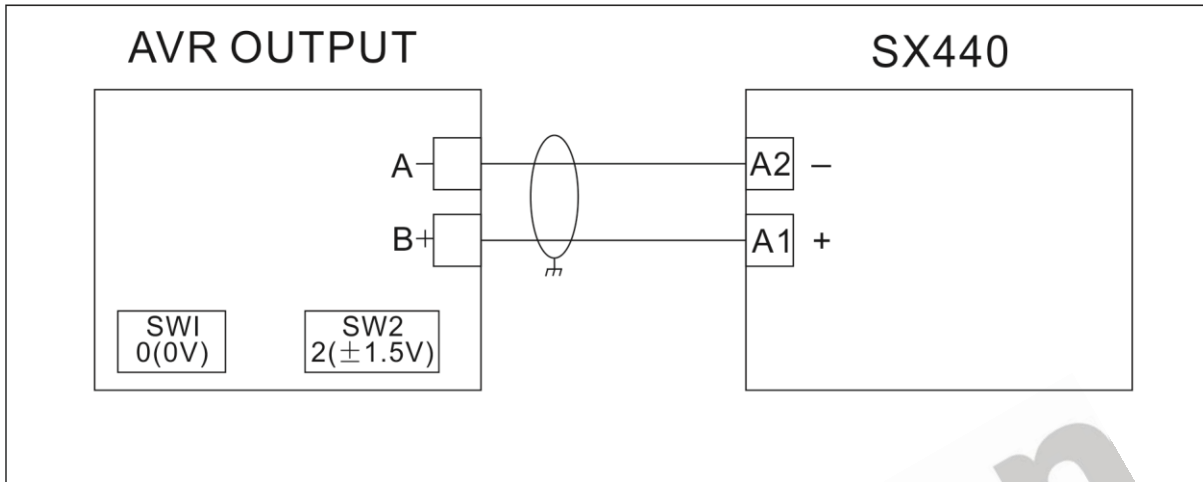
Engine speed is 1500r/min: SW1 = 5, SW2 = 1;

Engine speed is 1800r/min: SW1 = 6, SW2 = 1;

**3 AVR WIRING**

**3.1 STAMFORD**

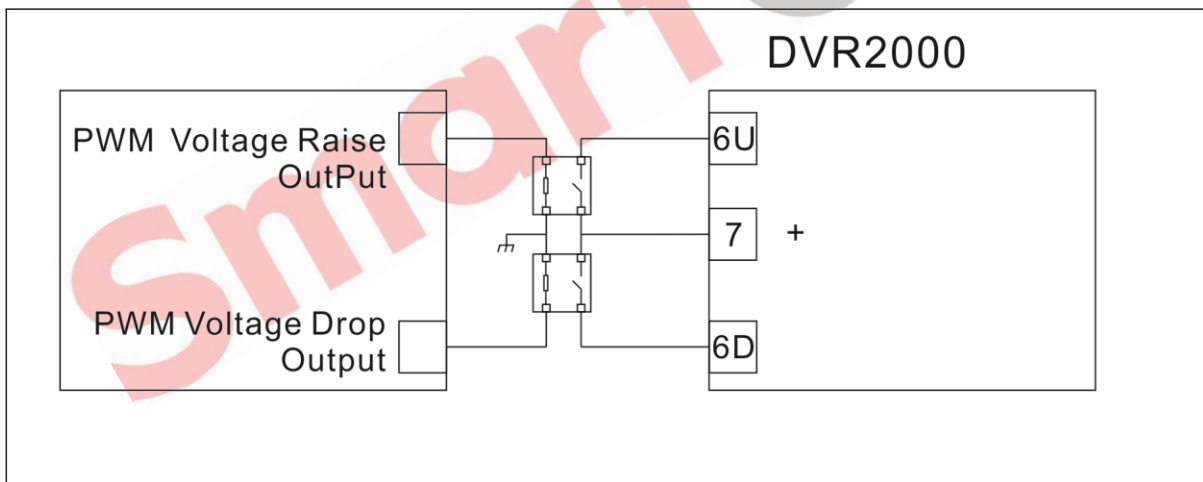
**3.1.1 SX421, SX440\*, SX465-2, AS440, MX321, MX325, MX327, MX341**



**Fig. 39 - SX440 Connection Diagram**

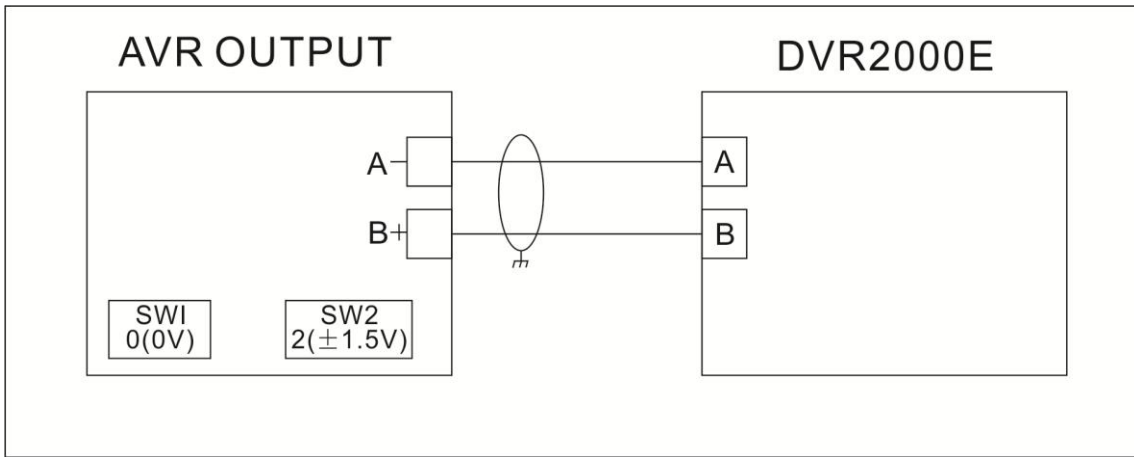
**3.2 MARATHON**

**3.2.1 DVR2000, DVR2000C**



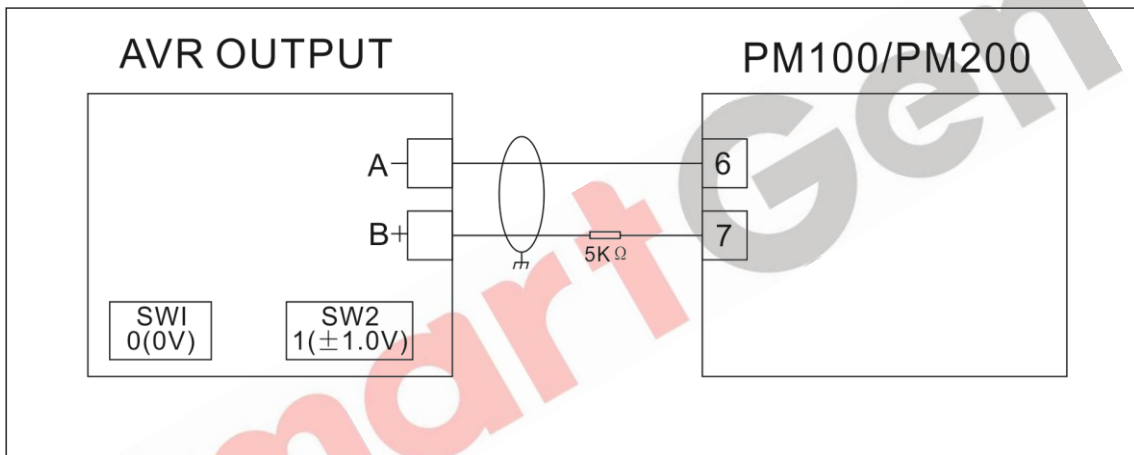
**Fig. 40 - DVR2000 Connection Diagram**

**3.2.2 DVR2000E**



**Fig. 41 - DVR2000E Connection Diagram**

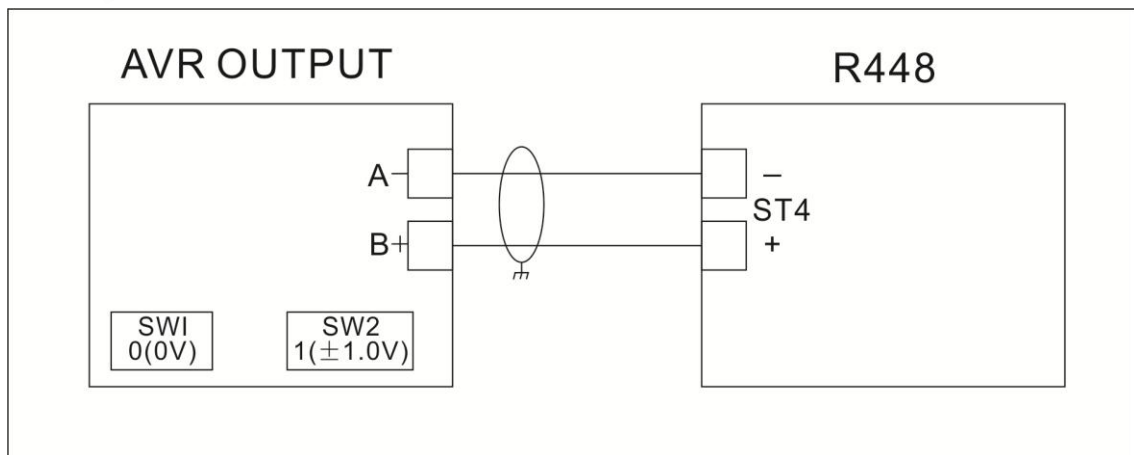
**3.2.3 PM100\* / PM200\***



**Fig. 42 - PM100/PM200 Connection Diagram**

**3.3 LEROY SOMER**

**3.3.1 R230, R438\*, R448, R449**



**Fig. 43 - R448 Connection Diagram**

3.3.2 R610 3F

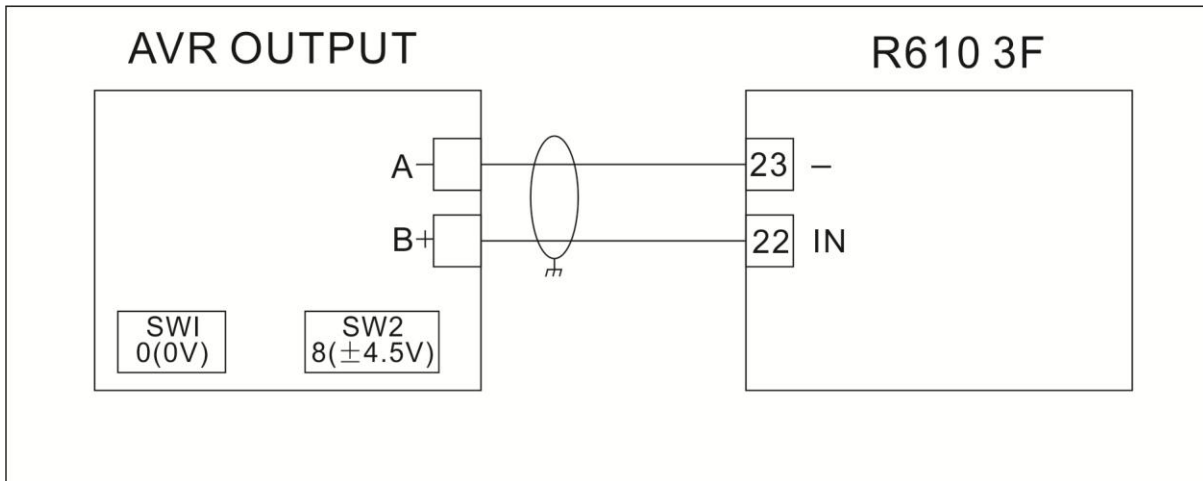


Fig. 44 - R610 3F Connection Diagram

3.4 ENGGA

3.4.1 WT-2, WT-3

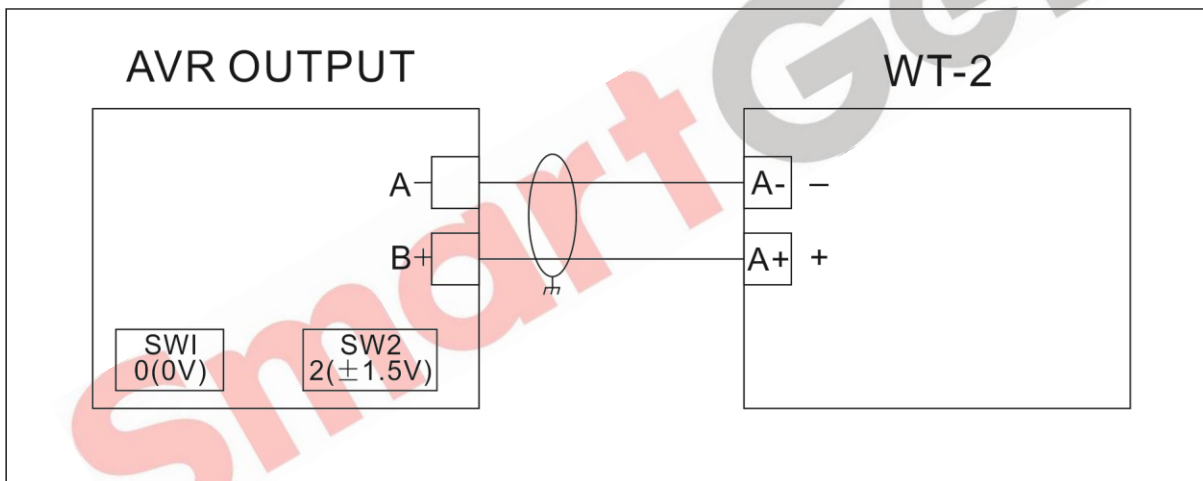


Fig. 45 - WT-2 Connection Diagram

3.5 MECC ALTE

3.5.1 DSR

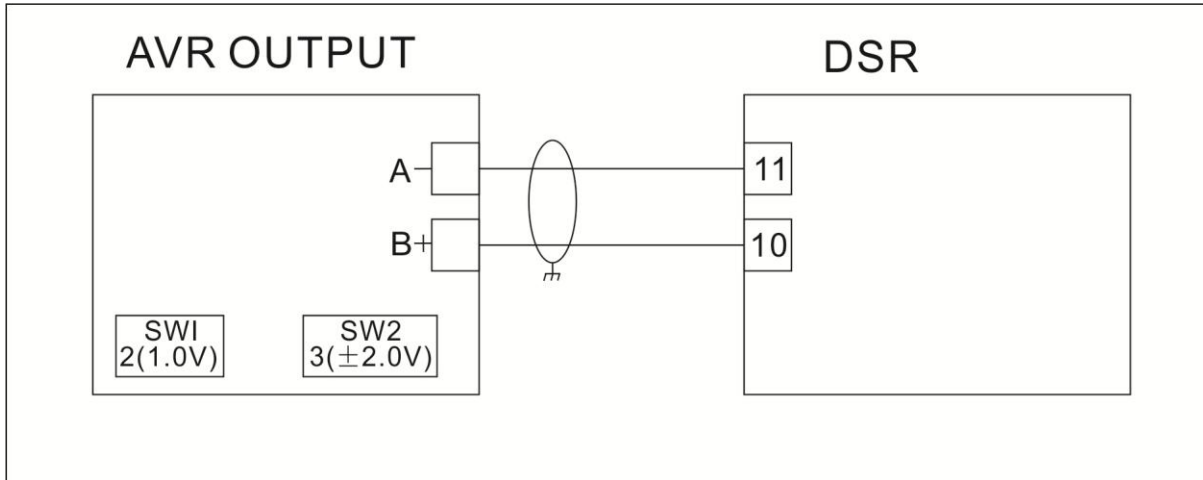


Fig. 46 - DSR Connection Diagram

3.5.2 S.R.7\*

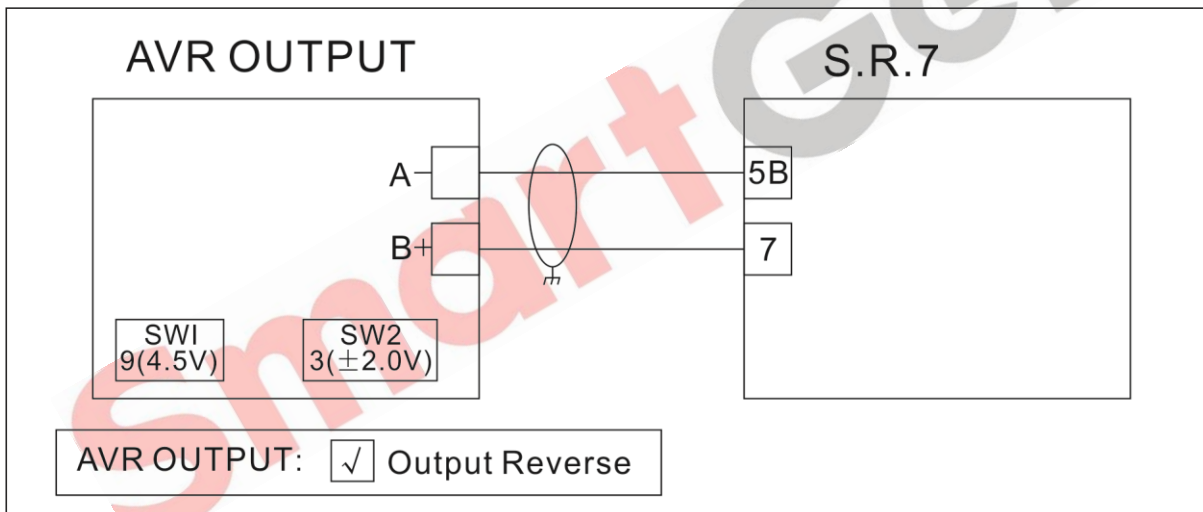


Fig. 47 - S.R.7 Connection Diagram

3.5.3 U.V.R. \*

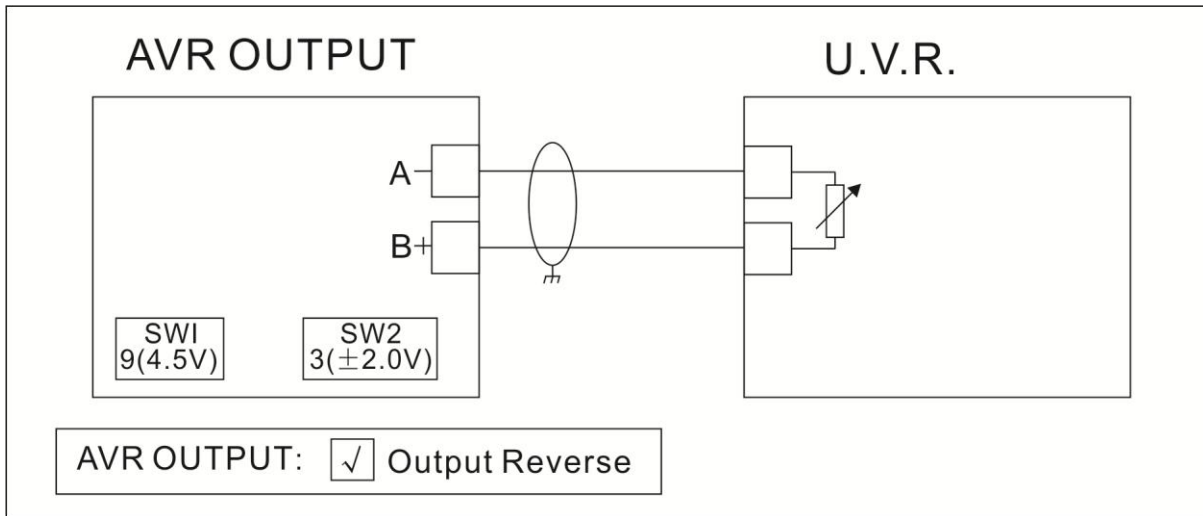


Fig. 48 - U.V.R. Connection Diagram

3.5.4 DER1

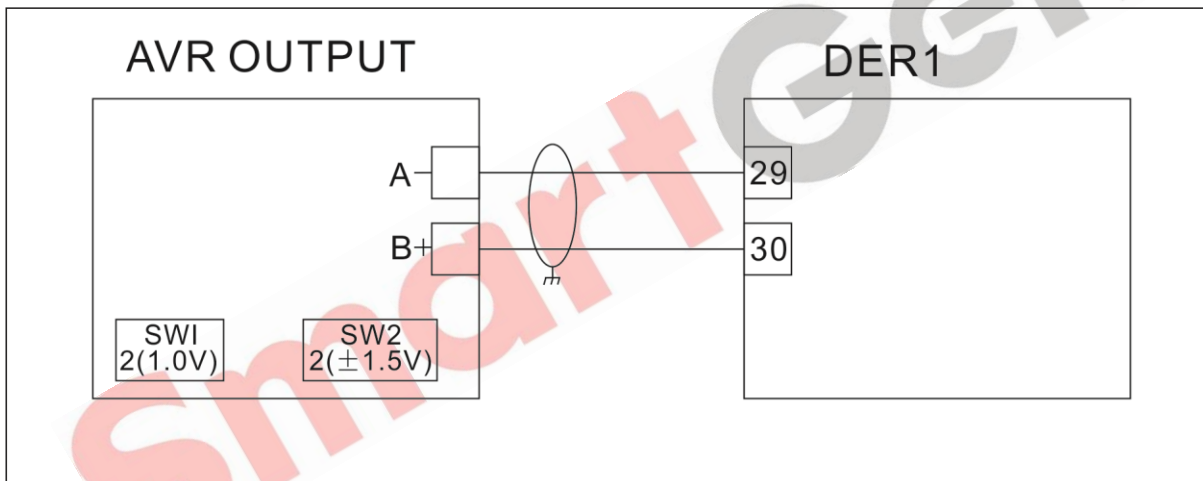


Fig. 49 - DER1 Connection Diagram

### 3.6 MARELLIMOTOR

#### 3.6.1 M16FA655A \*

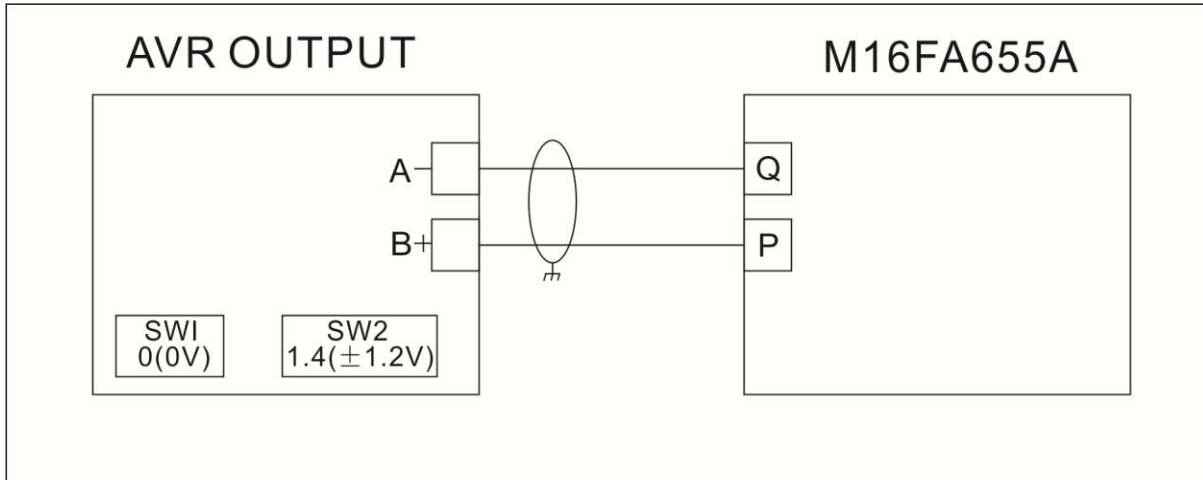
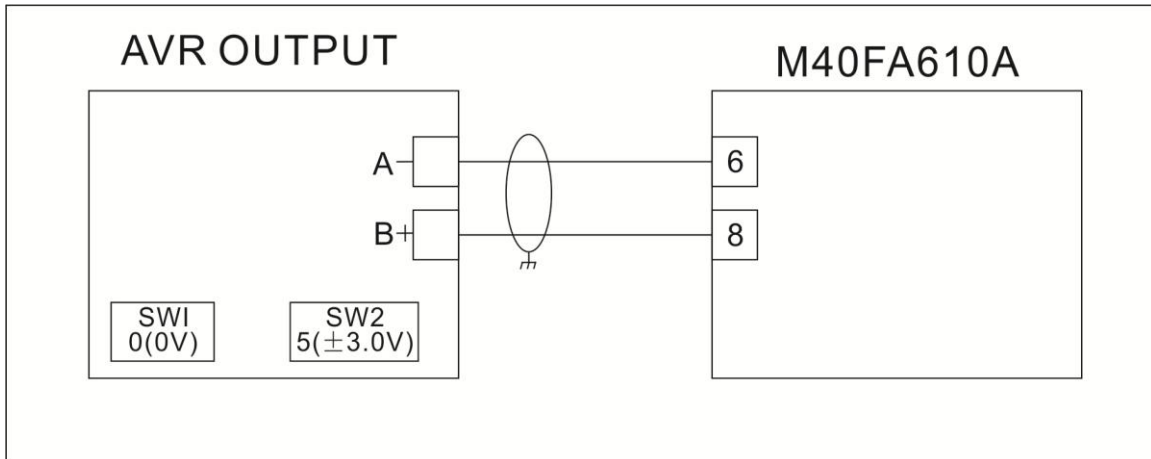


Fig.50 - M16FA655A Connection Diagram

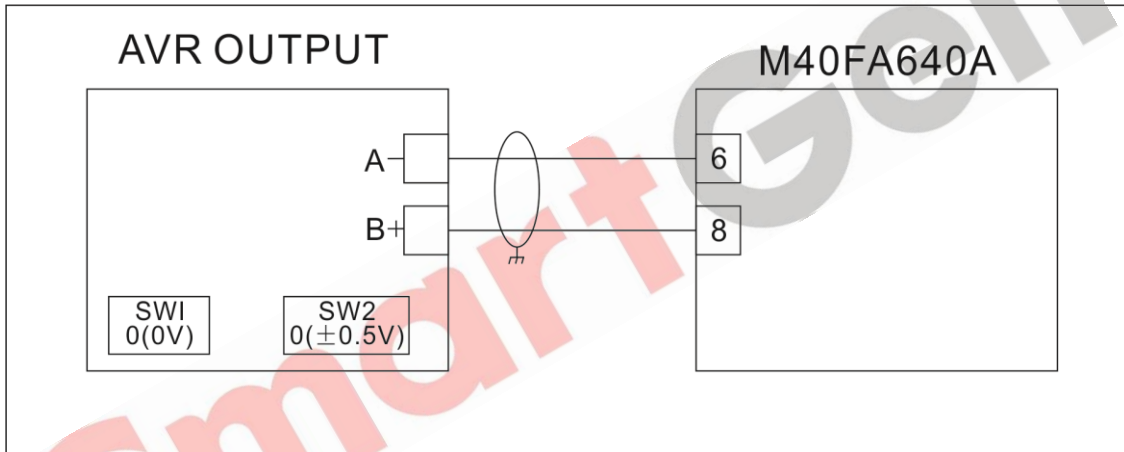
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**3.6.2 M40FA610A**



**Fig. 51 - M40FA610A Connection Diagram**

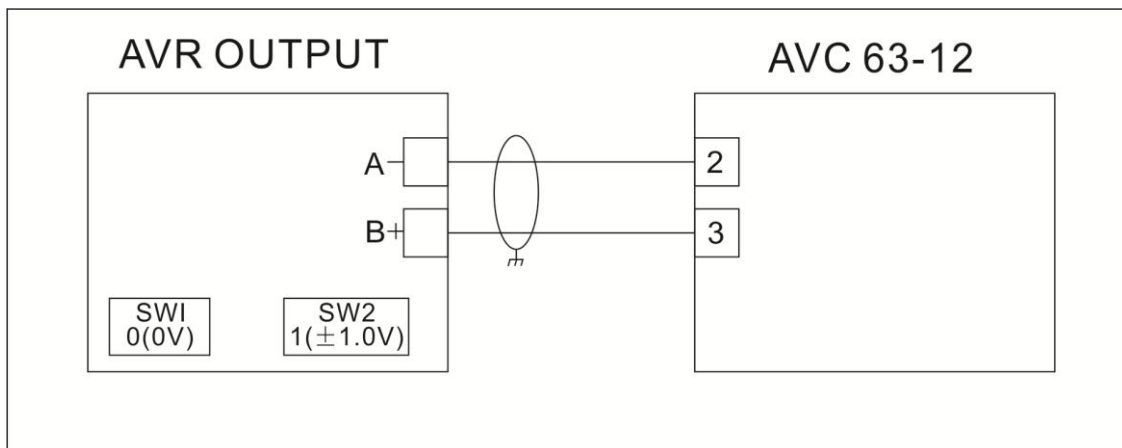
**3.6.3 M40FA640A \***



**Fig. 52 - M40FA640A Connection Diagram**

**3.7 BASLER**

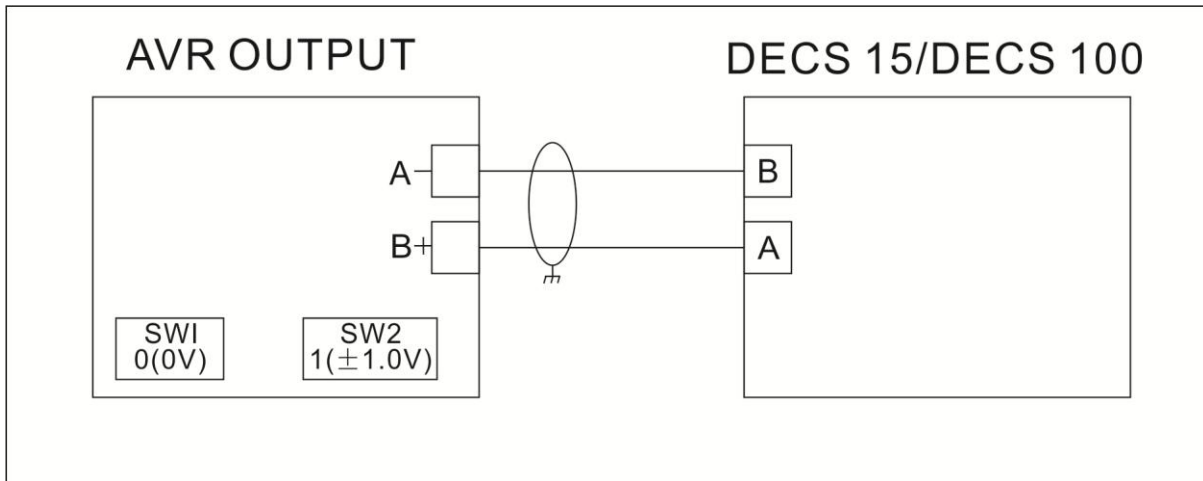
**3.7.1 AVC 63-12**



**Fig. 53 - AVC 63-12 Connection Diagram**

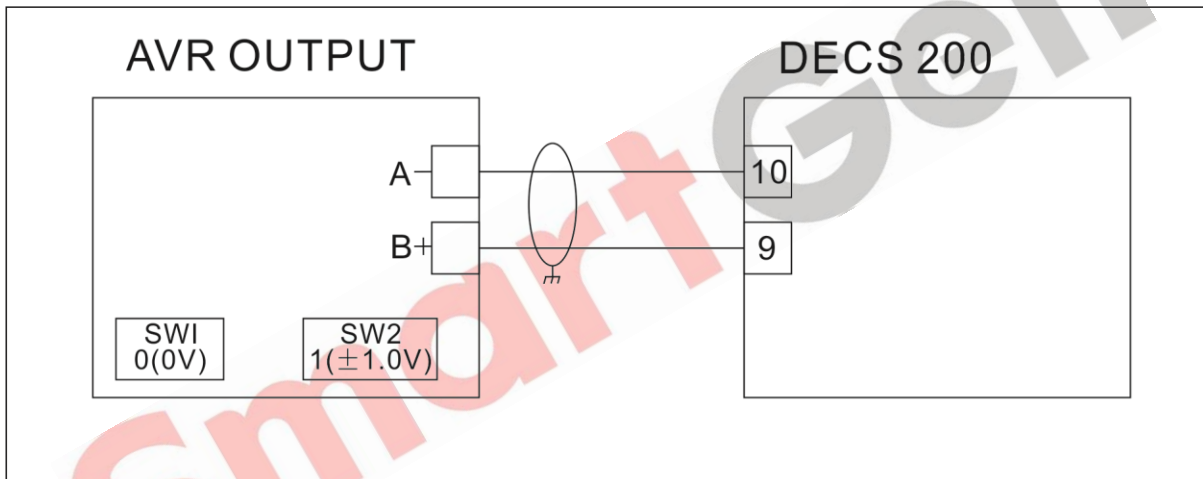


**3.7.2 DECS 15, DECS 100**



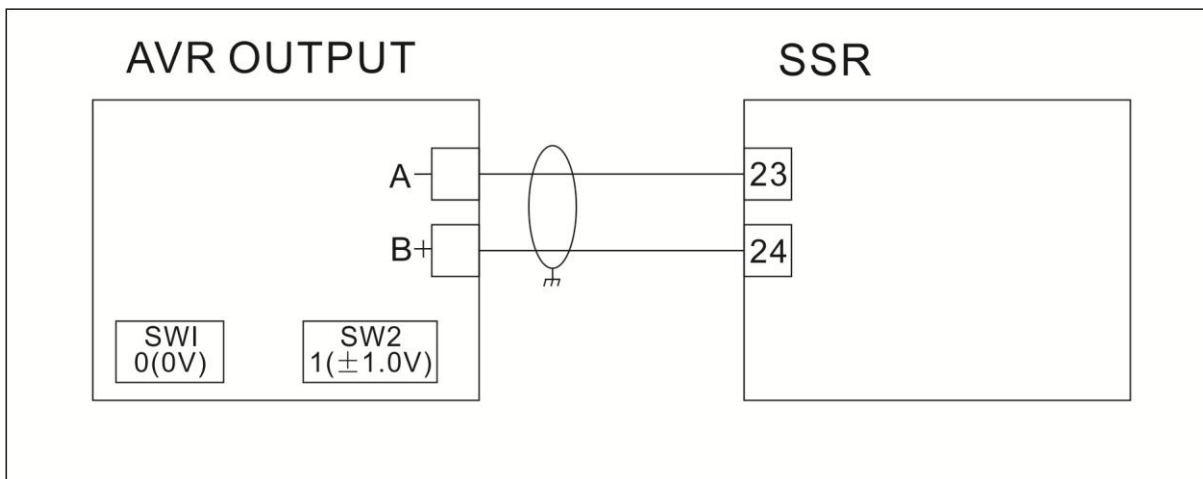
**Fig. 54 - DECS 15/DECS 100 Connection Diagram**

**3.7.3 DECS 200**



**Fig. 55 - DECS 200 Connection Diagram**

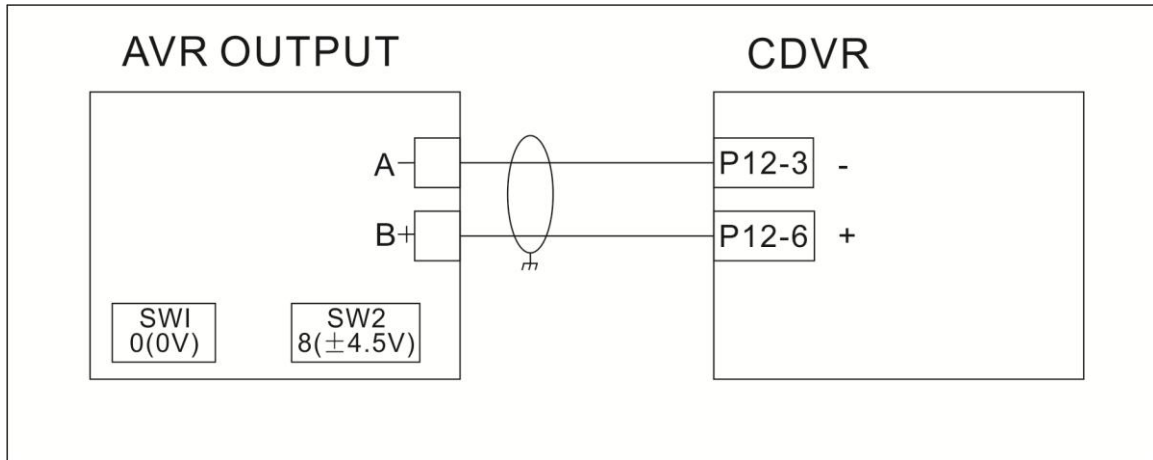
**3.7.4 SSR**



**Fig. 56 - SSR Connection Diagram**

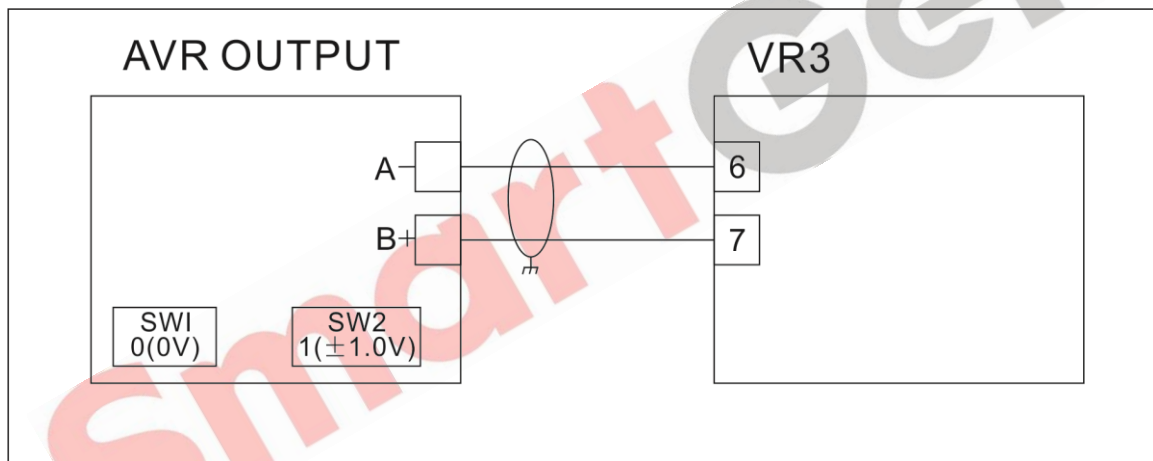
**3.8 CATERPILLAR**

**3.8.1 CDVR**



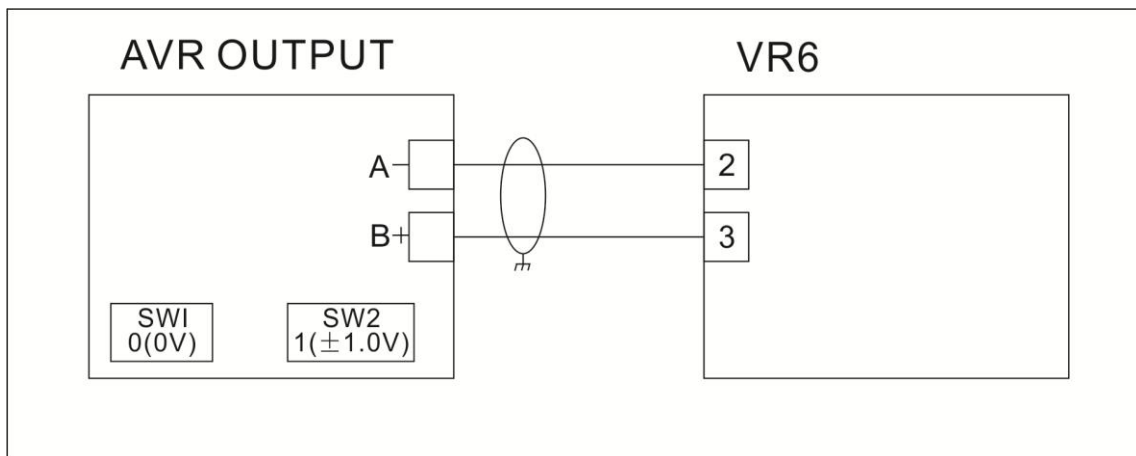
**Fig. 57 - CDVR Connection Diagram**

**3.8.2 VR3**



**Fig. 58 - VR3 Connection Diagram**

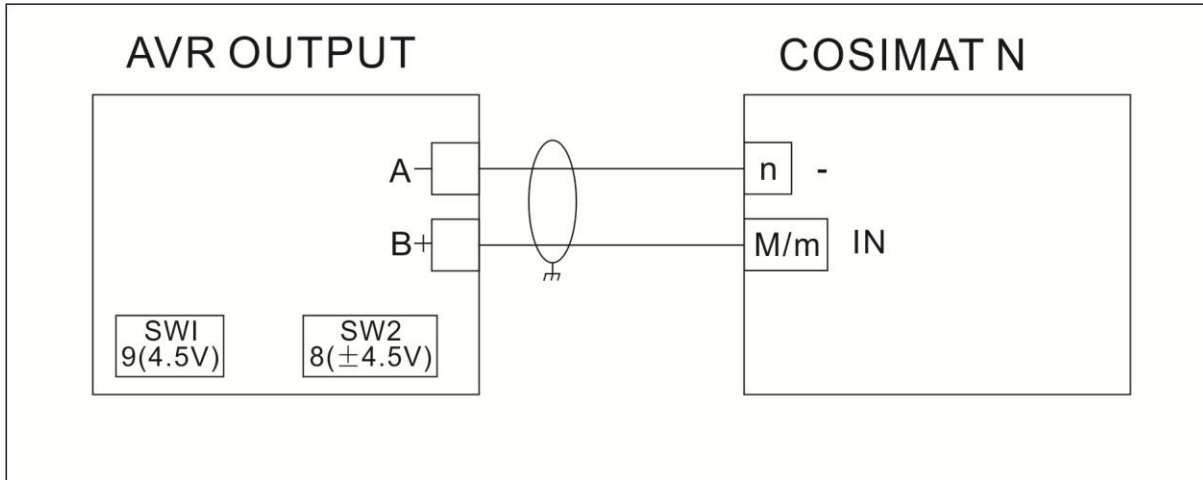
**3.8.3 VR6**



**Fig. 59 - VR6 Connection Diagram**

**3.9 COSIMAT**

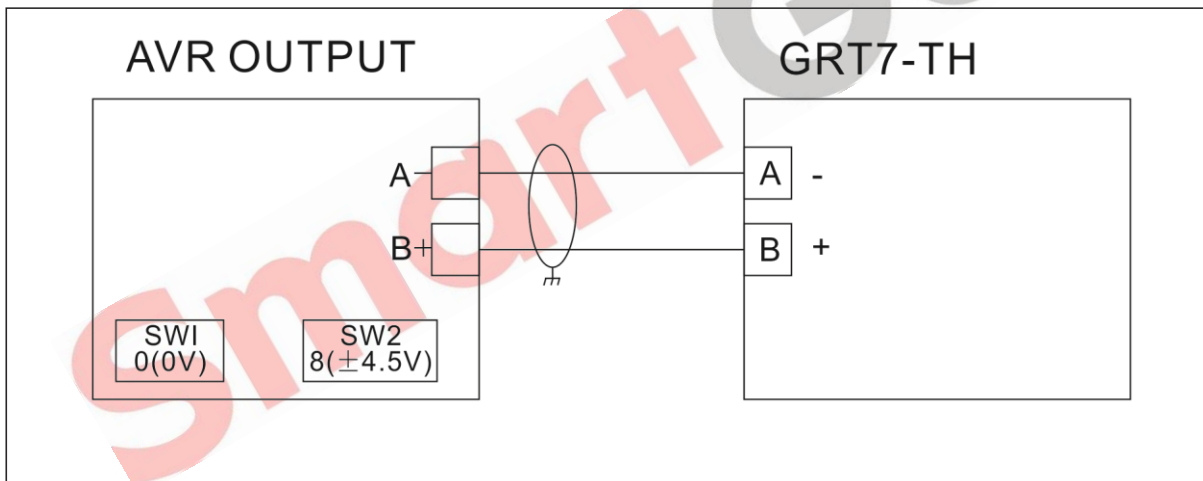
**3.9.1 COSIMAT N**



**Fig. 60 - COSIMAT N Connection Diagram**

**3.10 GRAMEYER**

**3.10.1 GRT7-TH\***



**Fig. 61 - CRT7-TH Connection Diagram**

3.11 KATO

3.11.1 K65-12B, K125-10B

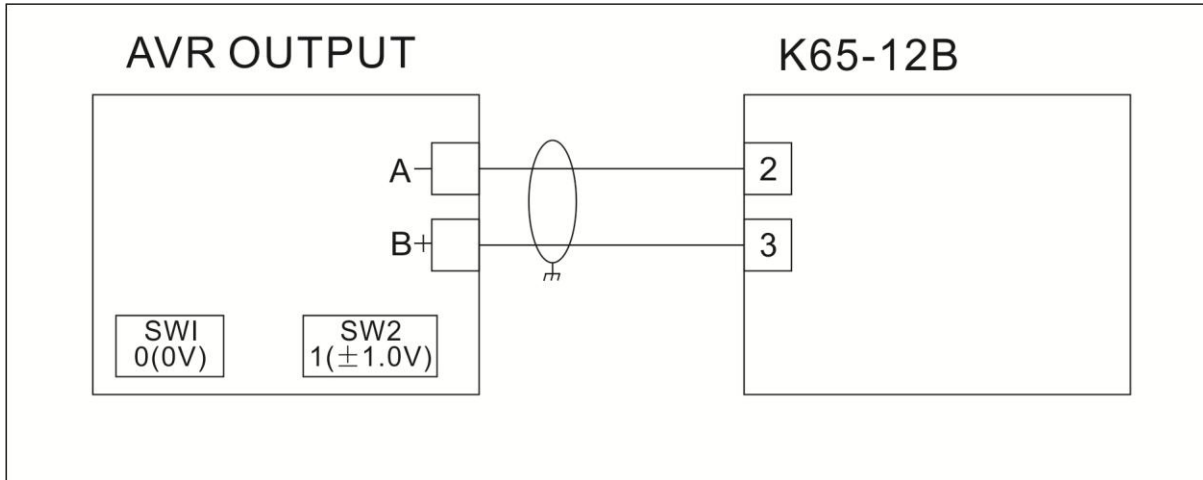


Fig. 62 - K65-12B Connection Diagram

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