START-UP INSTRUCTIONS

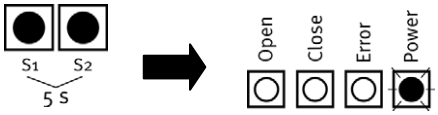
To put the VariFuel2 Stepper Motor Card into operation after installing it on a DIN rail in a control cabinet, proceed as follows.

DIL switch: = ON (up position) = OFF (down position)

1. Set switch *Manual/Auto* into down position *Manual.*

2. Wire the VariFuel2 Stepper Motor Card with encoder and stepper motor of the VariFuel2, power supply and, if required, master control (see page 2).

3. Set the rotation angle of the connected VariFuel2. For this purpose, hold buttons *S1* and *S2* simultaneously for 5 seconds to activate the programming mode.
   - Flashing status LED *Power* indicates active programming mode.



4. Set the rotation angle appropriate for the connected VariFuel2 type:

No compatibility with certain VariFuel2 types

Note that the VariFuel2 Stepper Motor Card is not compatible with VariFuel2 type 200-120D and all types with revision B stepper motors and higher.

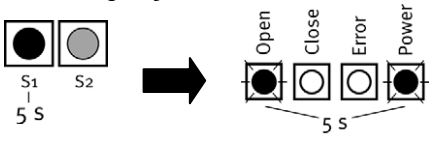
The revision of the stepper motor can be identified from the nameplate on the stepper motor of your VariFuel2. VariFuel2 stepper motors whose revisions are not stated on the nameplate or which are supplied without a nameplate are revision A stepper motors.

Type 100-50D: 79°

Type 140-65D: 48°

Type 200-100D: 59°

5. Save the rotation angle by holding button *S1* for 5 seconds.
   - Rotation angle is saved when status LEDs *Open* and *Power* are flashing for 5 seconds.



   - Stepper motor card initiates reference run.

6. Set signal processing for fuel ring control and position feedback with regard to the master control.

analog

digital

7. If signal processing is set to analog, also set analog input and output.

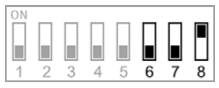
Analog input: Fuel ring control as

current signal 0 to 20 mA

voltage signal 0 to 10 V

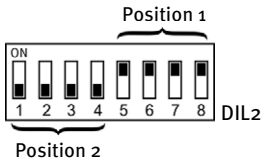
Analog output: Feedback of the fuel ring position as

current value 0 to 20 mA



voltage value 0 to 10 V

8. Optional: Set configurable opening angles (position 1 and 2).

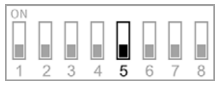


The positions of the switches correspond to the following opening angles:

0 = OFF, 1 = ON; 0 % = closed, 100 % = open

Switches	Opening	Switches	Opening
0000	0.0 %	1000	53.3 %
0001	6.7 %	1001	60.0 %
0010	13.3 %	1010	66.7 %
0011	20.0 %	1011	73.3 %
0100	26.7 %	1100	80.0 %
0101	33.3 %	1101	86.7 %
0110	40.0 %	1110	93.3 %
0111	46.7 %	1111	100.0 %

9. Make sure that DIL switch 5 on switch block DIL1 is in down position.



10. Use buttons *S1* and *S2* to check if the VariFuel2 stepper motor correctly moves into the open and closed positions in manual mode.

= towards open

= towards closed

   - If not, rotation angle might be set incorrectly (return to step 3).

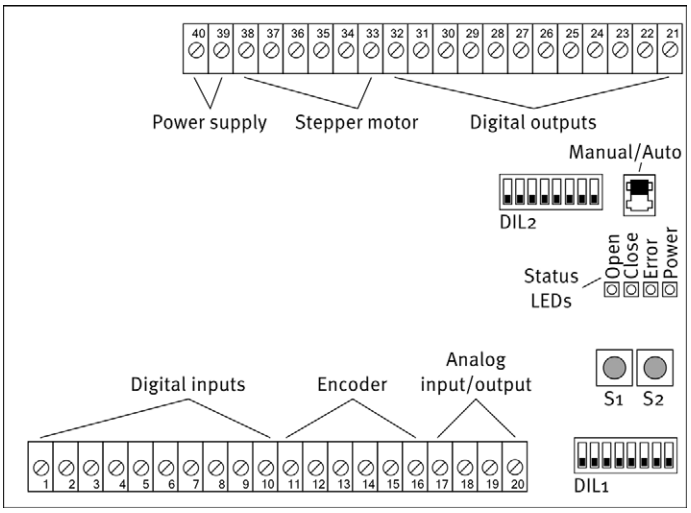
11. If yes, to check proper control by master control, set switch *Manual/Auto* into up position *Auto*.

12. Use master control to send control signals to the stepper motor card. Check if stepper motor approaches positions correctly.
   - If not, check wiring, signals of master control and positions of DIL switches on switch block DIL1.
   - If yes, the master control can take over the control of the stepper motor while the engine is running.

Connections

Terminals Digital Inputs

No.	Designation	Description
1	Pos_Digi_IN_Direction+	Direction of the fuel ring movement via pulses on *Pos_Digi_IN_Steps*
2	Pos_Digi_IN_Direction-	
3	Pos_Digi_IN_Steps+	Step-by-step movement of the fuel ring via pulses
4	Pos_Digi_IN_Steps-	
5	Pos_Control_IN_1+	High level moves fuel ring into configured position 1.
6	Pos_Control_IN_1-	
7	Pos_Control_IN_2+	High level moves fuel ring into configured position 2.
8	Pos_Control_IN_2-	
9	Reset+	High level for at least 10 ms resets stepper motor card.
10	Reset-	



Terminals Encoder + Stepper Motor

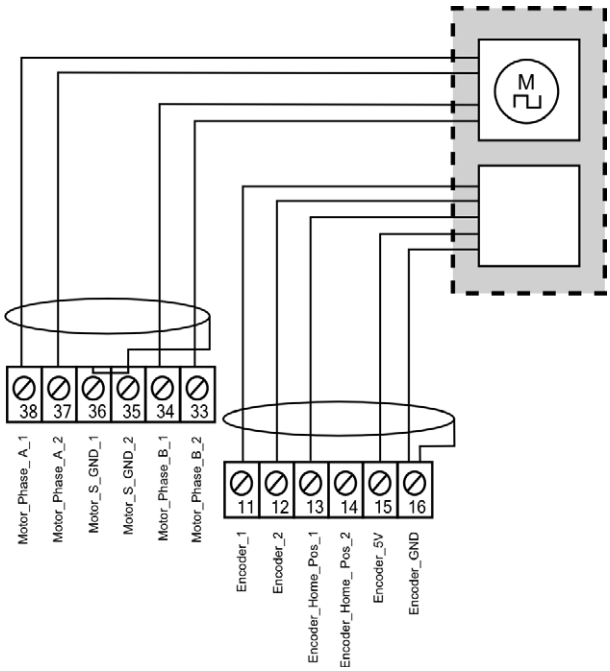
No.	Designation	Cable	PIN	Description	No.	Designation	Cable	PIN	Description
11	Encoder_1	white	E	Input for encoder signal phase A	33	Motor_Phase_B_2	4	D	Connection motor phase B
12	Encoder_2	green	F	Input for encoder signal phase B	34	Motor_Phase_B_1	3	C	
13	Encoder_Home_Pos_1	gray	G	Input for encoder signal home position 1	35	Motor_S_GND_2		H	Shield motor wiring
14	Encoder_Home_Pos_2			Input for encoder signal home position 2	36	Motor_S_GND_1		H	
15	Encoder_5V	yellow	I	Encoder 5 V supply	37	Motor_Phase_A_2	2	B	Connection motor phase A
16	Encoder_GND	brown	J + H	Reference potential encoder	38	Motor_Phase_A_1	1	A	

Terminals Analog Input / Output

No.	Designation	Description
17	Pos_Analog_IN	Analog input that is used to move the fuel ring with a current signal or a voltage signal.
18	Pos_Analog_IN_GND	
19	Pos_Analog_OUT	Analog output that provides feedback of the current fuel ring position by means of current or voltage.
20	Pos_Analog_OUT_GND	

Terminals Digital Outputs

No.	Designation	Description
21	Pos_Digi_OUT_Direction-	Feedback on the direction of the fuel ring movement via pulses
22	Pos_Digi_OUT_Direction+	
23	Pos_Digi_OUT_Steps-	Feedback on the steps of the fuel ring movement via pulses
24	Pos_Digi_OUT_Steps+	
25	Home_Pos_1_OUT-	High level when fuel ring is in open position
26	Home_Pos_1_OUT+	
27	Home_Pos_2_OUT-	High level when fuel ring is in closed position
28	Home_Pos_2_OUT+	
29	Drive_to_Ref_Pos_OUT-	High level during reference run
30	Drive_to_Ref_Pos_OUT+	
31	Error_OUT-	High level indicates error status
32	Error_OUT+	



Terminals Power Supply

No.	Designation	Description
39	UB_GND	Reference potential for operating voltage
40	UB	Operating voltage 24 V DC (18 to 27 V)