

B6475 Autostart panel

si6438
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catalogue section 30

Application note: CASCADE programming and B6478 harness for Volvo EMS/EMS2 engines



Overview

Murphy model B6475 is an automatic start/stop and fault protection control panel, primarily used with diesel-driven pumps.

Standard panel B6475 is supplied for use with 12VDC 'mechanical' (non-ECU) engines, but can be modified for 24VDC and/or 'electronic' (ECU-controlled, J1939 CANbus) engines if required. The sections below detail the standard configuration for 'mechanical' engines, and the modifications needed for Volvo EMS/EMS2 based 'electronic' engines. The section overleaf headed '12V/24V Conversion' details the modifications needed for use with 24VDC power supplies.

B6475 uses the Murphy CASCADE CD101 engine controller. CASCADE includes approximately 40 program functions – timers, inputs, outputs and control options – which allow the panel to be used with different engines and applications. For full details of CASCADE installation, programming and operation, please refer to document 00-02-0594.

Mechanical engines

Electrical Connection

Panel B6475 has a 21-pin Deutsch plug and socket in the enclosure base for connection of the engine wiring harness (supplied separately). For full B6475 panel connection details, please refer to circuit diagram SE6475.

CASCADE programming

The CASCADE controller in panel B6475 is programmed with default settings as listed in the standard CASCADE installation manual 00-02-0594, with the following exceptions:-

Param. num.	Description	Value	Comment
1	Engine speed source	Mag pickup	Charge alternator signal into CD101 mag pickup i/p
3	Crank timer	10 secs	
4	Crank rest timer	10 secs	
10	Cooldown	1 min	
18	Digital input 3	Immediate shutdown	
19	Digital input 4	Immediate shutdown	
23	Aux output 1	Engine running	
24	Aux output 2	Engine speed up	
25	Aux output 3	Engine speed down	
26	Aux output 4	AUTO mode	
30	Nominal gen freq	50Hz	
37	Overspeed level	20%	1800 rpm (see 52 below)
38	Underspeed level	50%	750 rpm (see 52 below)
52	Run speed, 100's digit	5	i.e. 1500 RPM nominal

The above and other CASCADE program settings should be reviewed and changed as appropriate for each application.

Electronic (Volvo EMS/EMS2) engines

If the B6475 is required for use with ECU-based J1939 CANbus engines (such as the Volvo EMS/EMS2), additional components and connections may be needed, and the CASCADE controller must be reprogrammed.



Electrical Connection

For Volvo EMS/EMS2 engines, 2 extra components are needed:-

part number	Description
B6478	Wiring harness, connected between the B6475 and the Volvo engine Bus Interface. This harness includes a Murphy SRC201-VSST CANbus interface.
79.70.0007	Murphy SRC-300 VSC CANbus interface and harness assembly, which needs to be connected inside panel B6475. (This part is supplied loose when ordering a B6478 harness above.)

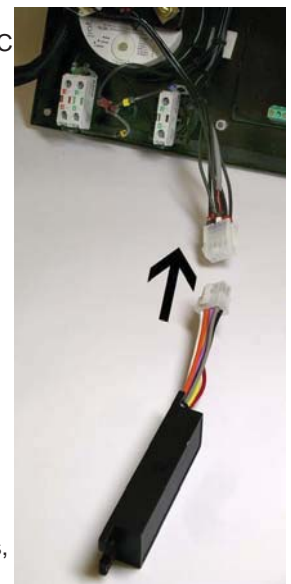
Connection procedure:-

- 1) Isolate DC power from the B6475 and engine ECU.
- 2) Disconnect the (mechanical engine) wiring harness from the 21-way Deutsch connector.
- 3) On the panel front fascia, remove the four corner securing screws and front plate.
- 4) Connect 79.70.0007 (SRC-300 VSC & connector) into the 8-pin Molex connector as shown right, and secure it to the existing internal harness with a cable-tie.
- 5) Refit and secure the B6475 front plate
- 6) Connect Murphy wiring harness B6478:-

- a) 21-way Deutsch connr into the B6475 panel base.
- b) 8-way Deutsch connector into the Volvo engine Bus Interface.

Harness B6478 also includes an additional pair of Deutsch connectors:-

- c) 3 way female, for connection of high/low float start/stop contacts, and
- d) 3 way male, for connection of additional engine shutdown inputs.



CASCADE programming

For the B6475 to operate correctly with harness B6478, 79.70.0007 and a Volvo EMS(2) engine, the following CASCADE settings MUST be made (note: these are the factory settings for the B6475):-

Param. num.	Description	Value	Comment
1	Engine speed source	ECU	For ECU-based engines
18	Digital input 3	Immediate shutdown	These are the factory settings for panel B6475, and may not therefore need resetting.
19	Digital input 4	Immediate shutdown	
23	Aux output 1	Engine running	
24	Aux output 2	Engine speed up	
25	Aux output 3	Engine speed down	
26	Aux output 4	AUTO mode	

In addition, the other CASCADE settings must be reviewed for each installation, in particular:-

Param. num.	Description	Default value	Comment
3	Crank timer	10 secs	
4	Crank rest timer	10 secs	
10	Cooldown	1 min	
30	Nominal gen freq	50Hz	
37	Overspeed level	20%	i.e. 1800 rpm (see also 51-54 below)
38	Underspeed level	50%	i.e. 750 rpm (see also 51-54 below)
39	Underspeed response	Warning	
42	Low batt voltage	10.5V	Typ. for 12V systems
43	High batt voltage	14.5V	Typ. for 12V systems
48 – 50	Flywheel tooth count	168	Charge alternator speed calibration
51 – 54	Run speed	1500 rpm	

12V/24V Conversion

With the exception of the AT series tachourmeter, all components used in panel B6475 (including the Cascade controller) can be used with either 12V or 24V DC power supplies. (No additional adjustment of components is needed).

Standard B6475 panels are supplied with 12V DC tachometers, but these can be converted for 24V usage by adding an ATVC voltage converter. The ATVC (part number 20.70.0176) is a small circuit board that mounts on the AT tachometer rear connection studs. For full details of AT series and ATVC installation, please refer to Murphy document 00-02-0258.

Panel operation

CASCADE has an Off/On keyswitch for isolating/connecting power to the panel. With the keyswitch in the On position, the operator controls the engine using the Cascade controller front facia push-keys: OFF, MAN(UAL), AUTO.

OFF

Press OFF to immediately stop the engine, or to reset a latched shutdown fault condition.

MAN

Press MAN for an immediate, automatic engine start. The CASCADE crank output operates, signalling the SRC201-VSST module, which sends (via CANbus/J1939) an engine crank command to the Volvo ECU.

The ECU automatically releases the starter motor once it detects an engine running condition. For 10 seconds after crank release, panel B6475 allows the engine to run at its (ECU-set) tick-over speed. After 10 seconds, engine speed can be manually increased or decreased by pushing the CASCADE front facia up and down keys. (Pushing these keys causes operation of the corresponding CASCADE output and SenderCAN SRC300-VCS input; the SRC-300-VCS then sends a CANbus TSC1 command to the ECU, which increases/decreases engine speed accordingly.)

AUTO

Press the AUTO key to select automatic start mode. Panel B6475 automatically starts the engine on activation (connection to negative DC) of its remote start input (panel terminal 17, CASCADE terminal 12). Automatic cranking, crank release and initial tick-over speed is as for manual mode.

30 seconds after crank release, the SenderCAN SRC300-VCS automatically ramps up engine speed (by sending TSC1 commands to the ECU) to a pre-stored Auto Mode Run Speed. On first installation, the Auto Mode Run Speed is 1000 RPM.

To increase or decrease the Auto Mode Run Speed, press the CASCADE up/down keys, as for Manual mode speed adjustment. The new speed is saved into memory (ready for the next automatic run) when the remote start input clears, or when the operator presses the OFF key.

ENOVATION CONTROLS CORPORATE HEADQUARTERS
5311 S 122ND EAST AVENUE, TULSA, OK 74146, USA

ENOVATION CONTROLS – SAN ANTONIO OFFICE
5757 FARINON DRIVE, SAN ANTONIO, TX 78249, USA

ENOVATION CONTROLS – HOUSTON OFFICE
105 RANDON DYER RD, ROSENBERG, TX 77471, USA

ENOVATION CONTROLS LTD. – UNITED KINGDOM
CHURCH ROAD, LAVERSTOCK, SALISBURY, SP1 1QZ, UK

MURPHY ECONTROLS TECHNOLOGIES – CHINA
77 23RD STREET, HANGZHOU ECONOMIC & TECHNOLOGICAL DEVELOPMENT AREA, HANGZHOU, ZHEJIANG 310018 CHINA

SALES & SUPPORT, NORTH AMERICA

MURPHY PRODUCTS:
PHONE: 918 317 4100
FAX: 918 317 4266
EMAIL: SALES@FWMURPHY.COM
WWW.FWMURPHY.COM

ECONTROLS PRODUCTS:
PHONE: 210 495 9772
FAX: 210 495 9791
EMAIL: INFO@ECONTROLS.COM
WWW.ECONTROLS.COM

MURPHY CONTROL SYSTEMS & SERVICES
PHONE: 281 633 4500
FAX: 281 633 4588
EMAIL: CSS-SOLUTIONS@FWMURPHY.COM

MURPHY INDUSTRIAL PANEL DIVISION
PHONE: 918 317 4100
FAX: 918 317 4124
EMAIL: IPDSALES@FWMURPHY.COM

SALES & SUPPORT, INTERNATIONAL

EUROPE, MIDDLE EAST & AFRICA
PHONE: +44 1722 410055
FAX: +44 1722 410088
EMAIL: SALES@FWMURPHY.CO.UK
WWW.FWMURPHY.CO.UK

CHINA
PHONE: +86 571 8788 6060
FAX: +86 571 8684 8878
EMAIL: APSALES@FWMURPHY.COM

LATIN AMERICA & CARIBBEAN
PHONE: +1 918 317 2500
EMAIL: LASALES@FWMURPHY.COM

SOUTH KOREA
PHONE: +82 70 7951 4100
EMAIL: SKOREASALES@FWMURPHY.COM

INDIA
PHONE: +91 91581 37633
EMAIL: INDIASALES@FWMURPHY.COM

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