Frank W. Murphy Ltd.

Control Panel Catalogue

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Frank W. Murphy Ltd. design and manufacture a wide range of control panels, diagnostic centres and instrument packages for engine-driven equipment. People around the world depend on our rugged and reliable control systems, in applications as diverse as irrigation and agriculture, industrial pumping, off-road equipment, marine propulsion and power generation.

This document contains sales bulletins, specifications and circuit diagrams for the Murphy UK range of control panels. An on-line internet reference, containing all the information in this catalogue plus cross-references to component part details, is also available at **www.fwmurphy.co.uk/panels**

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Control panels feature reference

Section 1 - Standard Panels

Stock code	*Panel name / description*	*bulletin/ spec sheet*	*circuit diagram*	*engine oil pressure*	*engine coolant temp*	*engine oil temp*	*gearbox oil pressure*	*pump pressure*	*charge fail warning lamp*	*main controller/ magnetic switch*	*keyswitch*	*tacho*	*mag. pickup*	*battery charger*	*enclosure type*	*extras/notes*
Standard Diagnostic Centres																
B3173	Basic diagnostic centre, 12V	SS6192	1E6170	-	-		-	-	YES	518APH	O/R/H/HS	-	-	-	33.140.	
B6091	Basic diagnostic centre, 24V	SS6192	1E6170	-	-	-	-	-	YES	518APH	O/R/H/HS	-	-	-	33.140.	
B5232	Intermediate diagnostic centre, 12V	SS6192	SE5622	20P	20T	-	-	-	YES	518APH	O/R/H/HS	-	-	-	38.170.	Hourmeter
B6175	Intermediate diagnostic centre, 24V	SS6192	SE5622	20P	20T	-	-	-	YES	518APH	O/R/H/HS	-	-	-	38.170.	Hourmeter
B5922	Advanced diagnostic centre, 12V	SS6192	6E5930	20P	20T	-	-	-	YES	518APH	O/R/H/HS	ATHA	-	-	38.200.	
B6178	Advanced diagnostic centre, 24V	SS6192	6E5930	20P	20T	-	-	-	YES	518APH	O/R/H/HS	ATHA	-	-	38.200.	
Standard irrigation panels																
B6453	PS660 irrigation panel, enclosed	SS6404	si6396	ESP sender, supplied	EST sender, supplied	-	-	4-20mA transdcr, supplied	LCD	PS660	Off/On	LCD	YES	-	PS660 enclosed	1) Emergency stop 2) Auto throttling with AT03069
B6452	PS660 irrigation panel, open frame	SS6404	si6396	ESP sender, supplied	EST sender, supplied	-	-	4-20mA transdcr, supplied	LCD	PS660	Off/On	LCD	YES	-	PS660 open frame	1) Emergency stop 2) Auto throttling with AT03069
B0188	33.400.689 Irrigation pump panel	SS6254	AE2884	20P	20T	-	-	OPLC	YES	MS2110	O/R/H/HS	-	-	-	38.400.	1) 15T 0 - 15 min pump low pressure lockout timer; 2) 24T 0 - 24 hour run timer
B4111	Same features as B0188 but in weatherproof enclosure, with expansion provision for OPL and tachometer	SS6254	ZE4312	20P	20T	-	-	OPLC	YES	MS2110	O/R/H/HS	-	-	-	SM4315	1) 15T 0 - 15 min pump low pressure lockout timer; 2) 24T 0 - 24 hour run timer
B5001	As B4111 but without weatherproof enclosure	SS6254	ZE5003	20P	20T	-	-	OPLC	YES	MS2110	O/R/H/HS	-	-	-	N/A	1) 15T 0 - 15 min pump low pressure lockout timer; 2) 24T 0 - 24 hour run timer
B6406	As B4111 plus additional OPLFC and AT67207 throttle control.	SS6254	ZE4312	20P	20T	-	-	OPLC	YES	MS2110	O/R/H/HS	-	-	-	SM4315	1) 15T 0 - 15 min pump low pressure lockout timer; 2) 24T 0 - 24 hour run timer; 3) Throttle control by OPLFC and AT03069
B2647	751602 Diagnostic Centre, 12V	SS6351	ZE2649	20P	20T	-	-	-	NO	518APH	-	-	-	-	751603	Emergency stop push button
B2643	751603 Diagnostic Centre, 12V	SS6351	ZE2613	20P	20T	-	-	20PHL	NO	518APH	-	-	-	-	751603	Emergency stop push button
WD series protection panels																
B2644	WD100 Diagnostic Centre, 12V	SS6349	TE2645	20P	20T	-	-	-	NO	518APH	-	-	-	-	WD1	Jackplug for auxiliary shutdown
B2880	WD107 Diagnostic Centre, 12V	SS6349	TE2641	20P	20T	-	-	-	NO	760	-	-	-	-	WD1	Alarms - SAH-A mini-siren and TL7 flashing lamp
B6407	B2880 (WD107) without oil line	SS6349	TE2641	20P	20T	-	-	-	NO	760A	-	-	-	-	WD1	Alarms - SAH-A mini-siren and TL7 flashing lamp
B2842	WD270 Diagnostic Centre, 12V	SS6349	TE2632	20P	20T	-	-	20PHL	NO	518APH	-	-	-	-	WD2	
B6300	WD277 Diagnostic Centre, 12V	SS6349	TE3154	20P	20T	20T	-	-	NO	760A	-	-	-	-	WD2	1) Alarms - SAH-A mini-siren and TL7 flashing lamp.
B5918	WD275 Diagnostic Centre, 12V	SS6349	TE5919	20P	20T	-	-	A25 PHLK	NO	518APH	-	-	-	-	WD2	15T 0 - 15 min low pump pressure lockout timer
Auto start/stop pump panel																
B6455	Auto start/stop pump panel	SS6349	SE6448	-	-	-	-	-	YES	ASM170	Man-Off-Auto	ATHS	YES	-	custom	1) IP54 enclosure 2) Quick connect float switches

Control panels feature reference (cont.)

Section 2 – Non-standard panels

Stock code	*Panel name / description*	*bulletin/ spec sheet*	*circuit diagram*	*engine oil pressure*	*engine coolant temp*	*engine oil temp*	*gearbox pressure*	*pump pressure*	*charge fail warning lamp*	*main controller/ magnetic switch*	*keyswitch*	*tacho*	*mag. pickup*	*battery charger*	*enclosure*	*extras/notes*
B0636	Diagnostic Centre, 24V	SS6352	SE0640	20PI	20TI	-	-	-	YES	761	O/R/S	ATHS	YES	-	SM0654	1) EG21 DC voltmeter; 2) 2CA; 3) SS300-24 engine overspeed switch; 4) SD85
B2900	Diagnostic Centre, 12V	SS6353	1E2903	-	-	-	-	-	YES	518APH	O/R/H/HS	-	-	-	33.140.	1) Wiring harness; 2) hourmeter
B2935	Diagnostic Centre, 12V	SS6354	5E2858	20P	20T	-	-	-	YES	518APH	O/R/H/HS	ATHA	-	-	33.200.	1) Wiring harness; 2) 60-0-60 ammeter
B3079	Marine monitoring panel, 24V	SS6355	5E3082	A20EO	A20ESR	-	A20PK	-	NO	-	OFF / START	-	-	-	33.200.	EG21 DC voltmeter. Monitoring only (no shutdown).
B4685	Autostart pump controller, 12V	SS4688	SE4686	-	-	-	-	-	YES	ASM200	-	-	YES	-	SM2451	
B5119	Autostart pump controller, 12V	SS5129	SE5124	-	-	-	-	-	YES	ASM200	-	MTH 6-1	YES	12V lead acid	SM5123	DC ammeter
B5935	Diagnostic Centre, 12V	ZS5936	ZE5940	20P	20T	-	-	-	YES	518APH	O/R/H/HS	ATHA	-	-	33.200.	Wiring harness
B6085	Diagnostic Centre, 12V	SS6356	1E6087	-	-	-	-	-	YES	518APH	O/R/H/HS	-	-	-	33.140.	1) wiring harness; 2) hourmeter
B6176	Diagnostic Centre, 12V	3S5985	3E5987	-	-	-	-	-	YES	518APH	O/R/H/HS	ATHA	-	-	38.170.	Wiring harness
B6314	Diagnostic Centre, 24V	SS4734	SE4733	-	-	-	-	-	YES	ASM200	Hand/Off/ Auto	ATHS	YES	-	38.200.	
B6413	Diagnostic Centre, 24V	SS6357	ZE5940	20P	20T	-	-	-	YES	518	O/R/H/HS	ATHA	-	-	33.200.	Wiring harness

Section 1 – Standard panels

Engine Diagnostic Centres

ss6192
revision B, 5th April 2002
catalogue section 30

General purpose engine control panels

The Murphy Diagnostic Centre range provides operator controlled starting and stopping of an engine, with automatic shutdown protection in the event of a fault. Several standard control panels are available, offering various levels of engine instrumentation and fault protection.

Operator control is via a four position keyswitch (OFF-RUN-HEAT-START). The key is removable in the OFF position. All panels include a Murphy magnetic switch with front facia dust boot. This latching switch removes power from an 'energised to run' fuel device (not supplied), shutting down the engine on detection of oil pressure or temperature faults. Additional safety switches can be easily added to the shutdown circuit. A DC supply fuse and charge alternator warning lamp are also fitted as standard.

Entry-level panels are designed for use with engine mounted oil pressure and coolant temperature fault switches (not supplied). Intermediate and advanced panels use Murphy Swichgages®: these provide indication of oil pressure (0 – 100 psi) and water temperature (50 - 120ºC), and allow customer settable shutdown trip levels. The oil pressure Swichgage® is supplied with a 2 metre oil line, 1/8" NPT fitting; the temperature Swichgage® includes a 2 metre capillary with 1/2" NPT fitting. Options are also available with an engine hours run counter or combined 'tachourmeter'.

All Diagnostic Centres are housed in a black painted, robust sheet steel enclosure, with shockmounts provided as standard. Circuit diagrams are supplied with each panel.

Warranty

A two year limited warranty on materials and workmanship is given with this Murphy product. Details are available on request and at **www.fwmurphy.co.uk/warranty**.

How to order

For price and availability, please contact our UK sales office:-

tel: +44 1722 410055
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email: sales@fwmurphy.co.uk

For standard models, please quote the stock number shown in the feature chart right.

Custom variations, automatic control panels and fuel shutoff devices are also available. Please contact our Sales department to discuss your requirements.

Accessories:-

Stock code **1H6082** – 10 way, 4 metre wiring harness

Feature reference

Stock number	Panel series	Supply volts (VDC)	Hinged front panel	Keyswitch (Off-Run-Heat-Start)	DC fuse	518-APH magnetic shutdown switch	Charge lamp	20P oil pressure Swichgage® & line	20T water temperature Swichgage®	Hours run counter	Tachourmeter	Spare 2" gauge position
B3173	33-140	12		●	●	●	●					
B6091	33-140	24		●	●	●	●					
B5232	38-170	12	●	●	●	●	●	●	●	●		
B6175	38-170	24	●	●	●	●	●	●	●	●		
B5922	38-200	12	●	●	●	●	●	●	●		●	●
B6178	38-200	24	●	●	●	●	●	●	●		●	●

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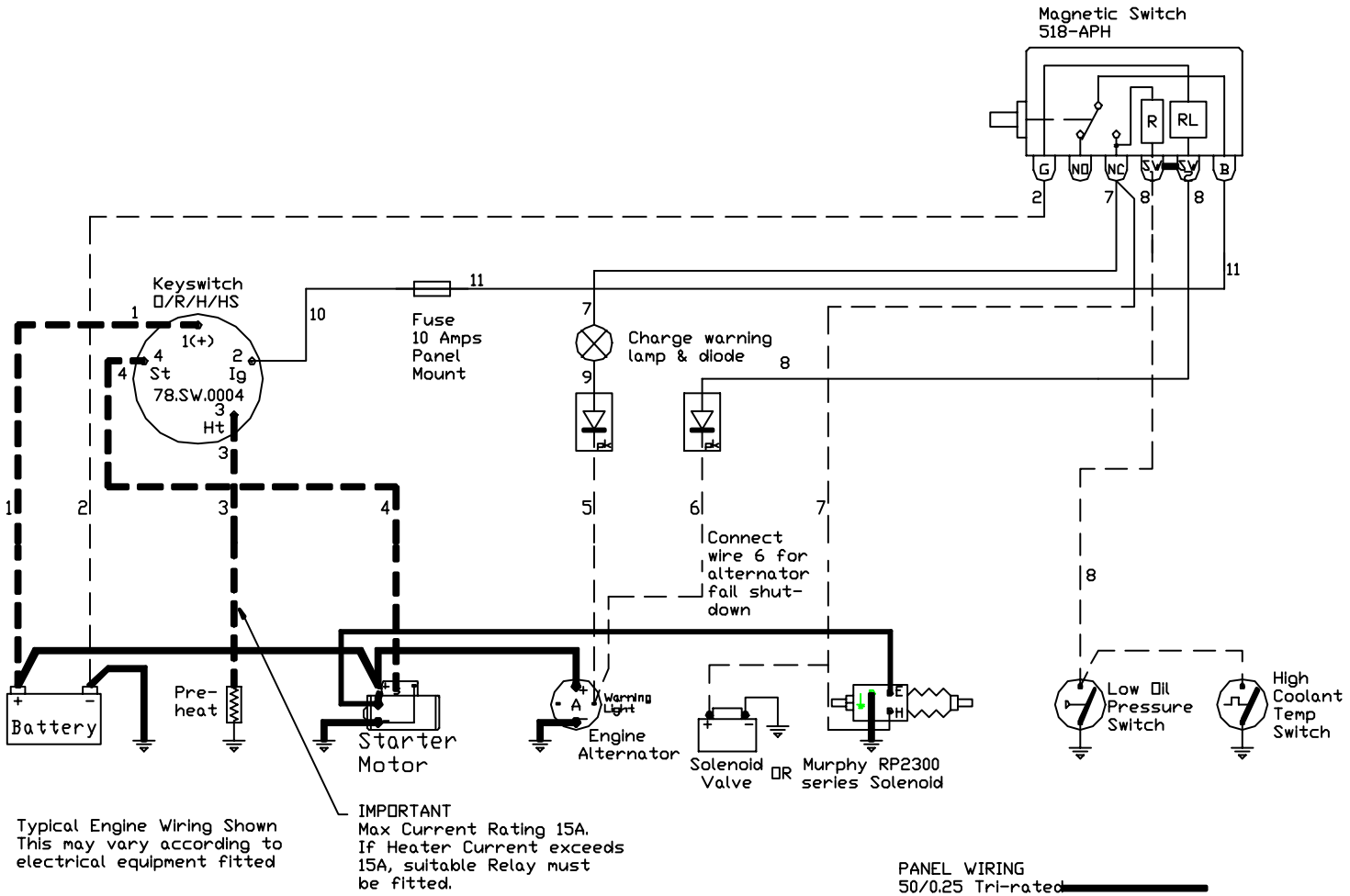
USA - ISO9001:2000 FM 28221
UK - ISO9001:2000 FM 29422

IF IN DOUBT ASK



REV	REVISION DETAILS	DATE	NAME
C	LOP Cust' Wiring Clarified	03/07/02	GR
B	LOP HET COnnection Added	15/10/01	GR
A	Various std panel compat'	09/08/01	GR

MAT.	N/A
FINISH	N/A
SCALE	NTS
DRAWN	GR
DATE	09/08/01

Tolerancing
Linear Dimensions
Nominal dimensions in mm

0.5 to 6	6 to 30	30 to 120	120 to 315	315 to 1000	1000 to 2000	2000 to 4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2

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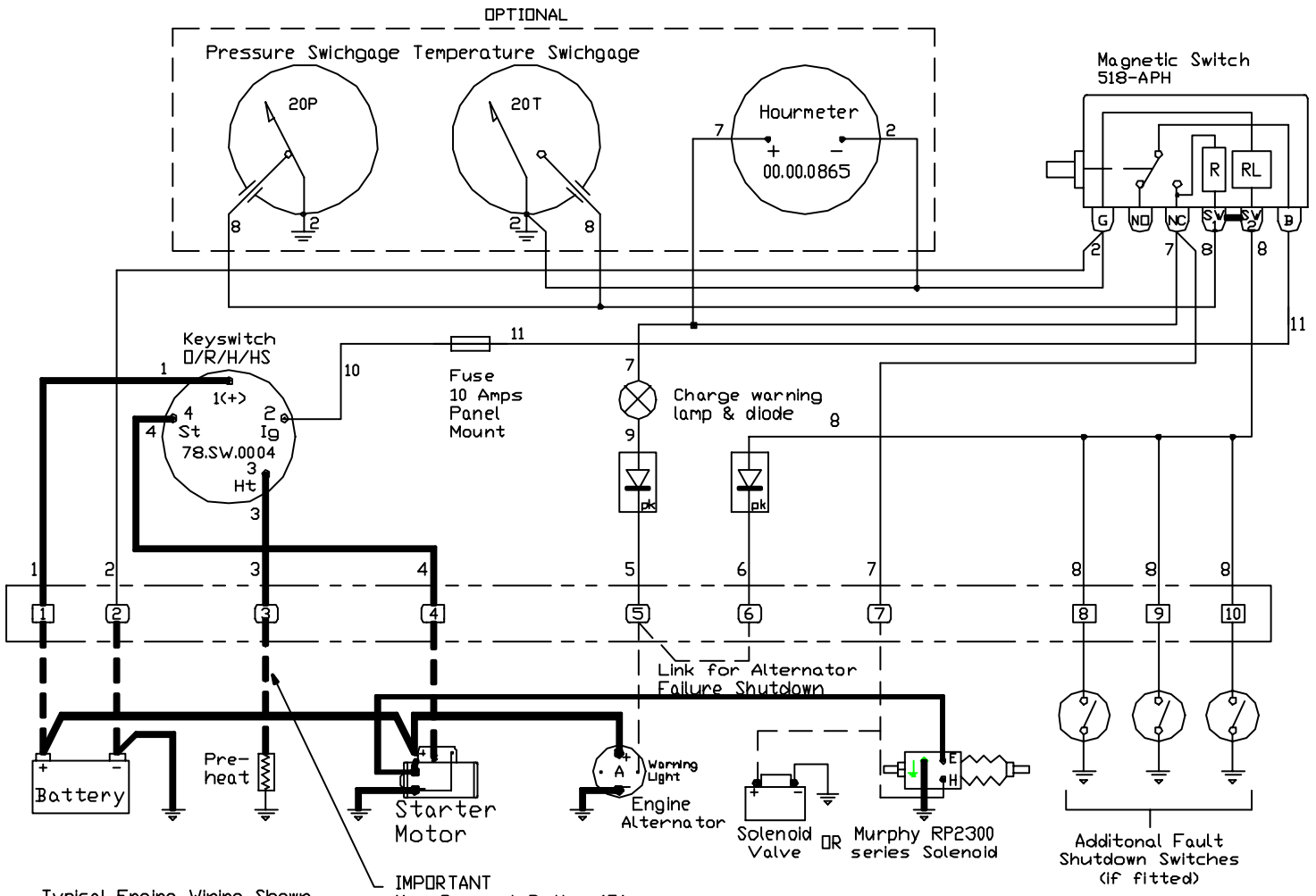
TITLE
DIAGNOSTIC
CENTRE

DRAWING No
1E6170

4

IF IN DOUBT ASK



PANEL WIRING
50/0.25 Tri-rated
16/0.2 tri-rated

LAST WIRE NUMBER 11

REV	REVISION DETAILS	DATE	NAME
C	Gauges optional (std panel)	28/09/00	PAG
B	Text Added	31/03/99	DPE
A	Changes as AMN1 1365, &		
	change k/s to 78.SW.0004	23/9/95	PAG

MAT.	N/A
FINISH	N/A
SCALE	NTS
DRAWN	PAG
DATE	16/8/95

Tolerancing
Linear Dimensions
Nominal dimensions in mm

0.5 to 6	6 to 30	30 to 120	120 to 315	315 to 1000	1000 to 2000	2000 to 4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2

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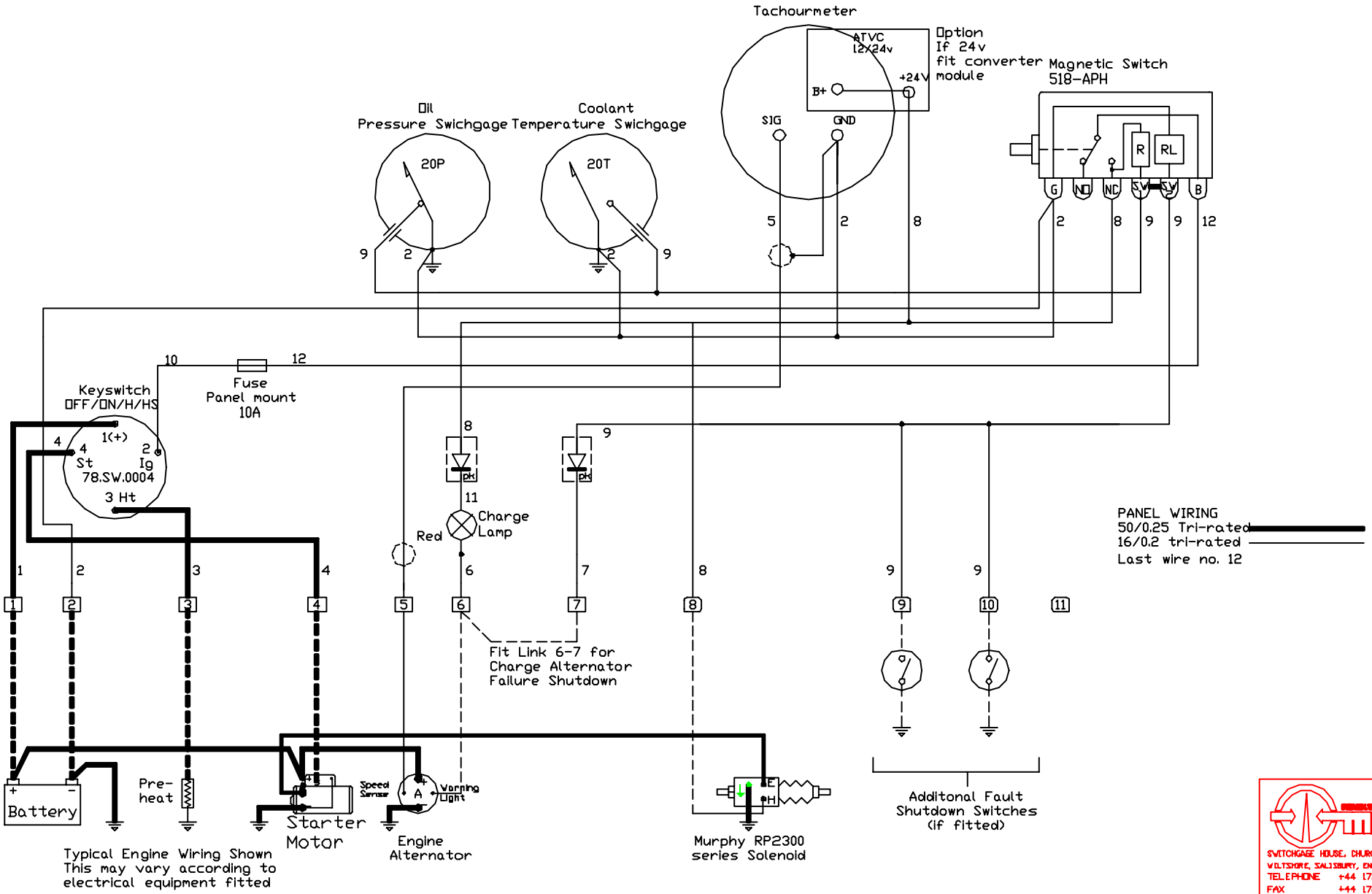
TITLE
DIAGNOSTIC
CENTRE 12/24V

DRAWING No
4E1512

IF IN DOUBT ASK



REV	REVISION DETAILS	DATE	NAME
A	Terminal wiring standardised	9/8/01	GR

MAT.	N/A
FINISH	N/A
SCALE	N/A
DRAWN	DPE
DATE	15/05/00

Tolerancing
Linear Dimensions
Nominal dimensions in mm

0.5 to 6	6 to 30	30 to 120	120 to 315	315 to 1000	1000 to 2000	2000 to 4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2

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TITLE
DIAGNOSTIC
CENTRE 12/24V

DRAWING No
6E5930

9

PS660 Irrigation Control Panel

ss6404
revision B, 3rd January 2006
catalogue section 30

- **Manual start/stop of engine-driven irrigators**
- **Automatic shutdown by timer, 'no flow' or engine/pump fault**
- **Automatic throttling to operator-set speed or pressure**
- **Weatherproof enclosure or flat-panel options**

Description

The PS660 is a microprocessor-based control, instrumentation and protection system for engine-driven irrigation pumps. The system provides all the features of the Murphy mechanical 33.400.689 panels (see bulletin ss6254), plus automatic engine throttling to maintain a set pump pressure.

Model B6452 is a flat-panel design for mounting in an acoustic enclosure. The panel includes the main PS660 control module, an on/off power keyswitch, supply fuses, output slave relays and a 2 metre wiring harness with screw terminal connector strip.

Model B6453 has the same control features, but is supplied in a weatherproof, lockable enclosure, complete with emergency stop push button and a clear window for viewing the main control module. Electrical connection is via a screw terminal strip inside the panel.

Operator control of both panels is through the PS660 control module. 5 push keys – Stop, Start, Mode, ▽ and △ – allow engine starting and stopping, selection of Idle or Duty running modes, and the increase or decrease of run time, target speed (in Idle mode) or target pressure (in Duty mode).

Pump shutdown, with optional 'cooldown' delay, can be by manual operator control, or can be automatic following a 'no-flow' condition, expiry of the 'run' time, or an engine/pump fault.

The PS660 control module has a 32 character backlit LCD for the display of operating mode, time delays, fault messages, target and actual pump pressures, engine speed/oil pressure/ coolant temp and hours run. Amber and red LEDs indicate warning and shutdown conditions.

Warranty

A two year limited warranty on materials and workmanship is given with this product. Full details are available at **www.fwmurphy.co.uk/warranty**

MURPHY

Product specification

Power supply:	
operating voltage: steady state range	5 – 40 V DC continuous
crank brown-out	to 0 V for >=100mS
current consumption: standby (typ)	95mA @ 12V, 55mA @ 24V
cranking (typ)	280mA @ 12V, 170mA @ 24V
Inputs:	
engine oil pressure & engine coolant temperature	Murphy resistive senders (see 'accessories' below), wired to negative DC
pump water pressure	4 – 20 mA / 0 – 600 psi transmitter
no flow, aux input 1 shutdown and aux input 2 warning	switch contacts, closing to negative on fault
magnetic pickup:-	
voltage range	2.5 – 25 V AC rms
frequency measurement range	0 – 10 kHz.
engine RPM display accuracy	<= 2% of full scale
engine RPM display resolution	10 RPM
Outputs:	*(all ratings for resistive load)*
start, fuel and preheat:	positive DC, switched relay:
B6452/B6453 slave relays	30 Amp @ 24V DC (per output), or 40 Amp @ 24V DC (combined outputs).
control module 41.70.012(	8 Amp @ 24V DC (per output), or 8 Amp @ 24V DC (combined outputs).
throttle up, throttle down and common alarm	negative DC (semiconductor), 500 mA max. @ 33 V DC
Physical:	
dimensions (W x H x D), weight	
enclosed panel (B6453)	400 x 500 x 240 mm, 17.5 Kg
open chassis (B6452)	362 x 384 x 195 mm, 3.9 Kg
control module (41.70.0126)	144 x 96 x 160 mm, 750 g
operating ambient temperature	–10 to +55 °C
Accessories supplied:	
magnetic pickup, 68.MP.0058	5/8" x 18 UNF, 48mm long
oil pressure sender, 00.00.3042	0-100 psi, 1/8" NPT, 2 wire
engine temp sender, 10.09.0051	0-150°C, 5/8" UNF, 2 wire
pump pressure transducer, PXT600	0-600 psi, 4-20mA, 1/4" NPTF

Operating parameters

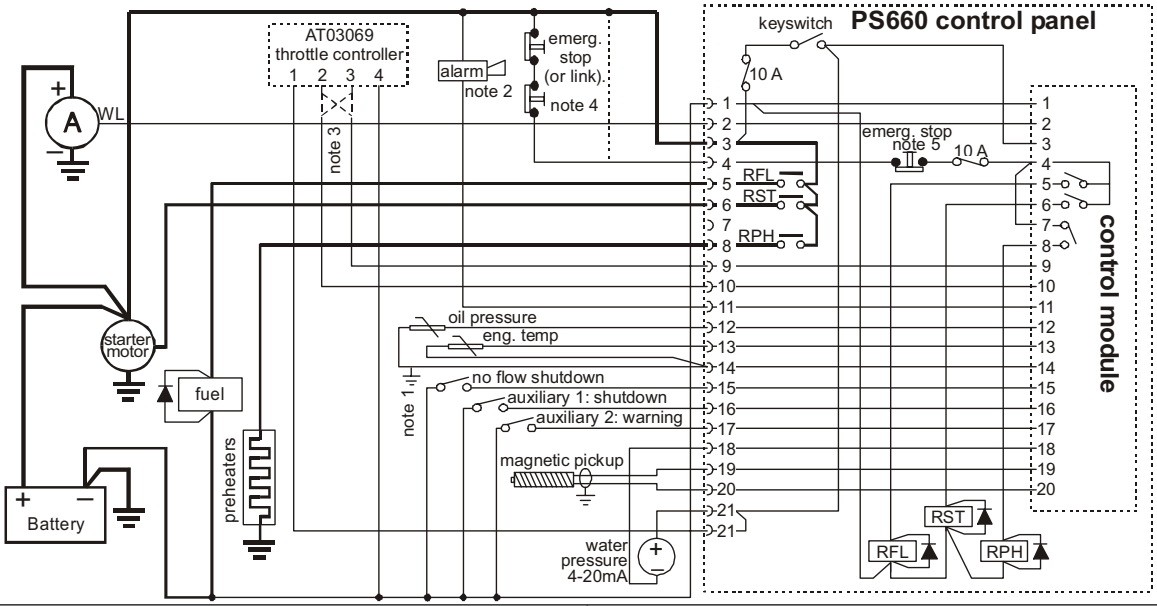
Function	*setting range/options*
Non-adjustable	
engine crank/rest time	10 sec (max) crank, 5 sec rest
start attempts	3 (max)
automatic crank release	500 RPM
low oil pressure shutdown	< 20 psi
high coolant temp. shutdown	> 98 °C
charge alt. (WL) fail voltage	10V
Adjustable (in normal operation)	
run time	1 min to 48 hrs, or 'constant'
target speed (idle mode)	min = 500 RPM, max = 4000 RPM or overspeed level minus 500 RPM
target pressure (duty mode)	50 to 550 psi
Adjustable (in program mode)	
preheat time	0, 5, 10 or 15 seconds
engine override time	3 – 60 sec (1 sec steps)
pump override time	10 sec to 60 min (1 sec steps)
cooldown time	0 sec to 10 min (1 sec steps)
pressure units	PSI or BAR
pump high pressure shutdown	50 – 550 psi (10 psi steps) or 3 – 39 bar (0.5 bar steps)
overspeed shutdown	1000 – 4000 RPM
throttle deadband	0-500 RPM (idle) / 0-200 psi (duty)
throttle up/down rate	1 (slow) to 5 (fast)

Electrical connection

Panel electrical connection is via a screw terminal strip. On model B6452, the terminal strip is at the end of a 2m wiring harness; on model B6453, the terminal strip is fixed inside the weatherproof enclosure. The terminal numbering for both panel versions (and control module) is as follows:-

1	Battery negative power supply
2	Charge alternator WL
3	Battery positive power supply, 5 to 40 VDC
4	Battery positive relay feed / emergency stop
5	Fuel output, positive DC
6	Starter (crank) output, positive DC
7	- - No connection - - (+ve feed for preheat on control module)
8	Preheat output, positive DC
9	Throttle up output, negative DC (transistor, 500mA max)
10	Throttle down output, negative DC (transistor, 500mA max)
11	Common alarm output, negative DC (transistor, 500mA max)
12	Oil pressure resistive sender ground
13	Engine temp resistive sender
14	Sender common return/ground
15	No flow input: shutdown (close to negative to activate)
16	Auxiliary 1 input: shutdown (close to negative to activate)
17	Auxiliary 2 input: warning only (close to negative to activate)
18	Pump pressure 4 – 20 mA (0 – 600 psi) transducer negative
19	Magnetic pickup speed input negative
20	Magnetic pickup speed input positive
21	Battery positive keyswitch output (2 terminals provided)

Typical connection



How to order

stock code	*model / description*
B6452	PS660 irrigation panel, flat-panel version, supplied complete with:- - **68.MP.0058** magnetic pickup - **00.00.3042** 100 psi oil pressure sender - **10.09.0051** 150°C engine temp sender - **PXT600** pump pressure 4-20mA transmitter
B6453	Weatherproof enclosure version of above.
B6452-D **B6453-D**	Dirty water versions of above, with diaphragm on PXT600 transmitter
41.70.0126	PS660 control module only

Further information

document	*description*
si6396	PS660 installation and operation
ys6336	magnetic pickup sales bulletin
00-02-0181	magnetic pickup installation
ys6347	EG(S) electric gauge and ES sender bulletin
EG21-96048N	EG/ES series installation
PXT-01041B	PXT pressure transducer sales bulletin
PXT-01044N	PXT pressure transducer installation

Further information on our range of irrigation control equipment is available at **www.fwmurphy.co.uk/irrigation**

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USA - ISO9001:2000 FM 28221
UK - ISO9001:2000 FM 29422

In order to consistently bring you the highest quality, full featured products, we reserve the right to change our specifications and designs at any time.

Irrigation Pump Diagnostic Centres

ss6254
revision A, 21st October 2003
catalogue section 30

B4111 Diagnostic Centre

Our standard control panel for engine driven pump irrigation:-

- **Lockable enclosure, weatherproof to IP55**
- **Pump run timer, adjustable up to 24 hours**
- **Swichgage® engine oil pressure indication/shutdown**
- **Swichgage® engine temperature indication/shutdown**
- **Engine hours run counter**
- **Pump pressure Swichgage®, with high/low adjustment**
- **Off-Run-Preheat-Start Keyswitch**
- **12 or 24VDC operation**

The 4 position keyswitch allows manual starting and stopping of the pump. The 'pump run' timer may be used for automatic shutdown after a preset time. Auto shutdowns are fitted for:-

- Low pump pressure, set by adjustable Swichgage®. The design also allows for shutdown triggered by a customer supplied 'no-flow' switch.
- High pump pressure, set by adjustable Swichgage®
- Timer expired, or (customer supplied) emergency stop contact

Also included:-

- Low pump pressure override-on-start timer, 0 – 15 mins
- Charge warning lamp
- Fuse holder
- Pre-punched apertures for upgrade with tachometer and/or auto throttling pressure Swichgage® (available separately).
- Provision for customer supplied emergency stop circuit
- Tubing kits for pressure Swichgages®

B4111

B5001 Diagnostic Centre

As B4111 above but supplied as an open backed chassis (less lockable panel), ideal for mounting in an acoustic enclosure.

B0188 Diagnostic Centre

The original Murphy 33.400.689 irrigation pump panel, fitted in a standard steel enclosure with anti-vibration mounts. Specification is otherwise similar to B4111, but without the hours run counter and pre-punched upgrade apertures. Available with an optional 3 metre wiring harness, model B3459.

33.400.689

How to order

For details of your nearest Murphy irrigation controls stockist, please contact our UK sales office:-

tel: +44 (0)1722 410055
fax: +44 (0)1722 410088
email: sales@fwmurphy.co.uk

or visit our website **www.fwmurphy.co.uk/irrigation**

Accessories

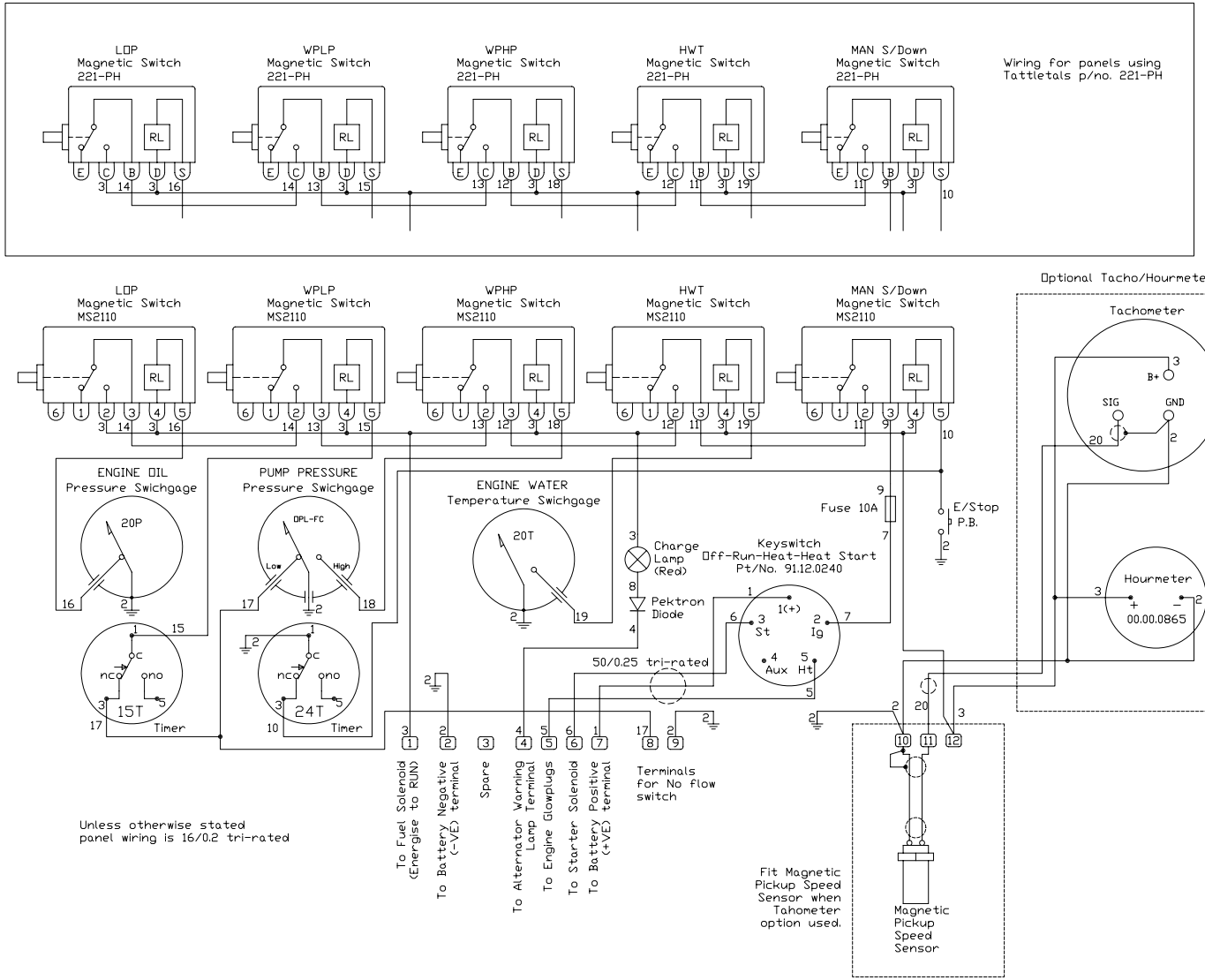
PD8183 water pressure pulsation dampener, 1/4NPT fitting
RP75 rackpuller for fuel cut-off

Warranty

A two year limited warranty on materials and workmanship is given with this Murphy product. Full details are available on request and at **www.fwmurphy.co.uk/warranty**.

FRANK W MURPHY LTD.
Church Road, Laverstock, Salisbury, SP1 1QZ, United Kingdom
tel: +44 (0)1722 410055 **fax:** +44 (0)1722 410088
email: sales@fwmurphy.co.uk **web:** www.fwmurphy.co.uk

IF IN DOUBT ASK



FRANK W MURPHY LTD
SWICHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
TELEPHONE 01722 410055
FAX 01722 410088
TELEX 477088

REV	REVISION DETAILS	DATE	NAME
A	Change to MS2110	19/8/03	GR

Customer

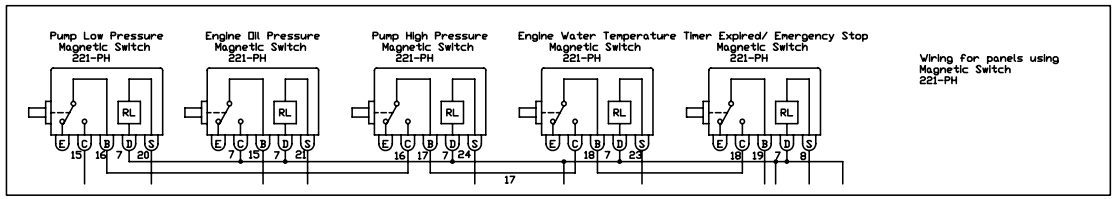
Murphy works order number

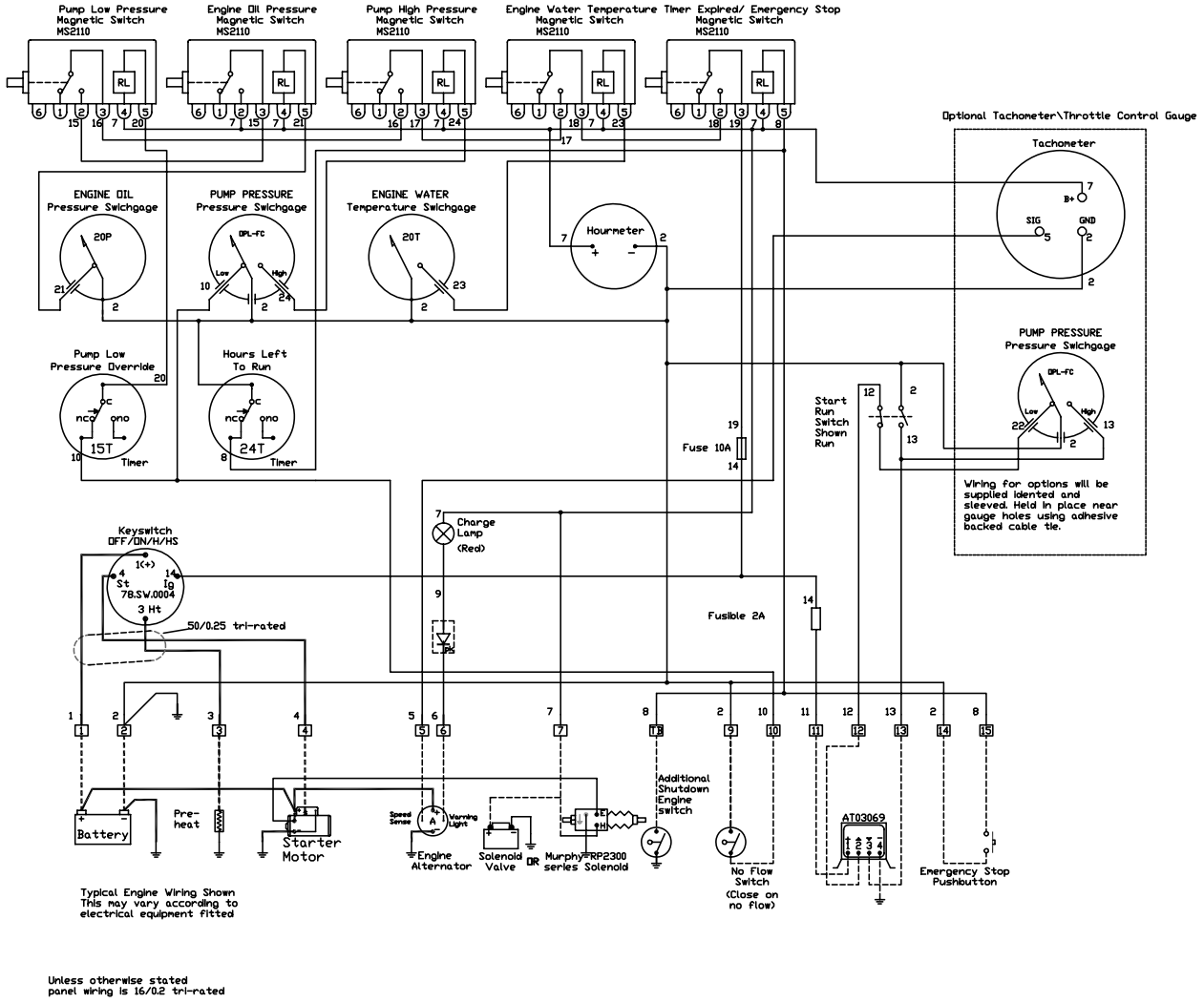
MAT.	n/
FINISH	n/a
SCALE	n/a
DRAWN	M. Lough
DATE	28/07/97

TITLE
38-400-689
Circuit Diagram

DRAWING No
AE2884

IF IN DOUBT ASK





11

REV	REVISION DETAILS	DATE	NAME
D	Change to AT03069 Controller	03/02/05	CAL
C	Changhe to MS2110	18/8/03	GR
B	French Layer Added	14-06-99	AS
A	W/N Updated, Titles Added	01-03-99	ML

Customer

Murphy works order number

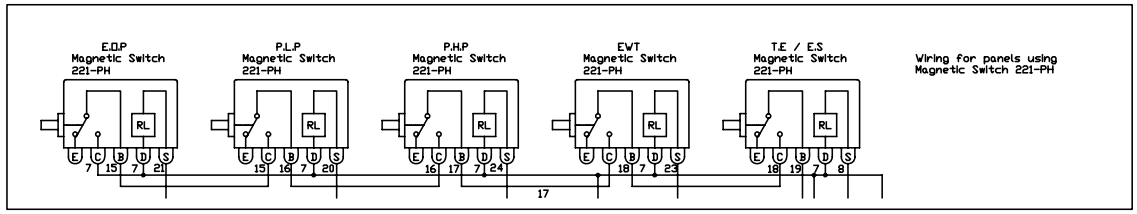
MAT.	n/
FINISH	n/a
SCALE	n/a
DRAWN	M. Lough
DATE	16/09/98

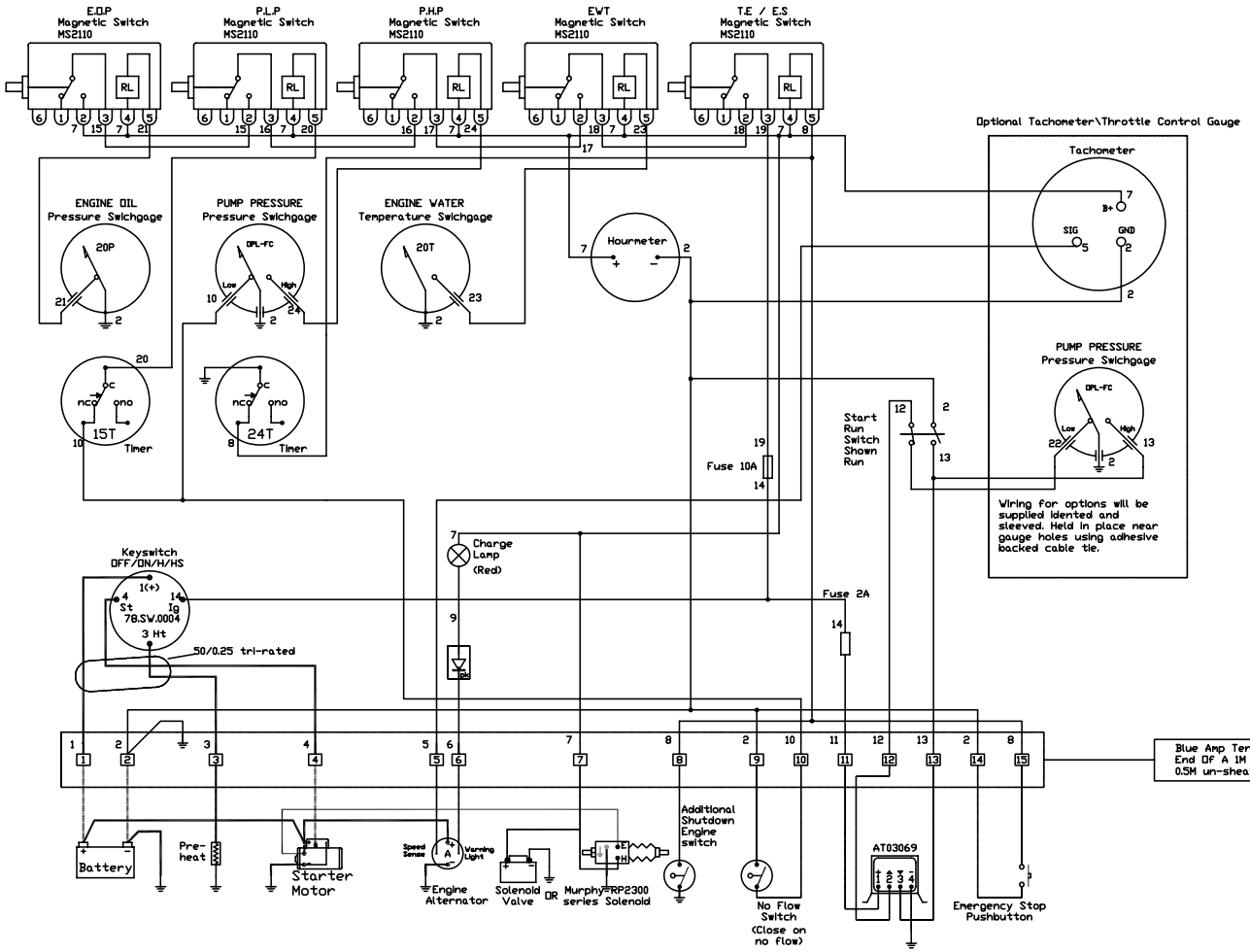
FRANK W murphy LTD
SWICHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
TELEPHONE 01722 410055
FAX 01722 410088
TELEX 477088

TITLE
169-98 Panel Circuit Diagram

DRAWING No
ZE4312

IF IN DOUBT ASK





12

REV	REVISION DETAILS	DATE	NAME
C	Change to AT03069 Controller	03/02/05	CAL
B	Change to MS2110	19/8/03	GR
A	Wire Numbers Udated	01-03-99	AS
	Magswitch Text Updated		

Customer	
Murphy works order number	

MAT.	n/
FINISH	n/a
SCALE	n/a
DRAWN	AS
DATE	26-02-99

FRANK W murphy LTD
SWICHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
TELEPHONE 01722 410055
FAX 01722 410088
TELEX 477088

TITLE
Diagnostic Centre
689 Inner Door

DRAWING No
ZE5003

751602 / 751603 series
Engine and Pump Diagnostic Centres

ss6351
24th April 2003
catalogue section 30

- **Fault protection panels for engines and pumps**
- **Swichgage® indication and automatic fault shutdown**
- **Compact and easy to install**

Description

751602 and 751603 panels provide simple and reliable fault protection for engine-driven and pump applications.

The panels use the accurate and dependable Murphy Swichgage® for status indication and adjustable limit fault shutdown. Both panels feature Swichgages® for engine oil pressure (0 - 100 psi / 7 Bar) and coolant temperatures (50 - 120°C), plus a front facia emergency stop push-button. Model 751603 additionally has a 0 - 20 Bar water pressure Swichgage®, with user-adjustable shutdown limits for high and low pump pressure.

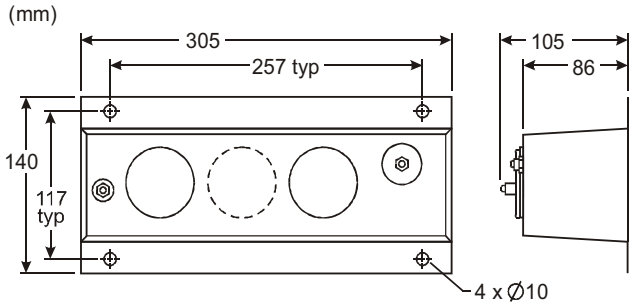
The 75160 series is designed for use with 12V engines with energised-to-run type fuel solenoids. Automatic fuel shutoff is by use of Murphy 518APH magnetic switch contacts. The switch is manually held in reset during engine/pump startup, but will release and latch following an engine fault.

75160 panels use a rugged black plastic, surface-mounted casing. Standard models are supplied complete with a 2 metre oil line and adaptors, 3 crimped wires for electrical connection (battery positive, negative and fuel/shutdown output) and a wiring diagram. A 2 metre water pressure utility line is additionally supplied with the 751603.

Warranty

A two year limited warranty on materials and workmanship is given with this Murphy product. Full details are available on request and at **www.fwmurphy.co.uk/warranty**.

Dimensions



How to order

Stock code	*Model/description*
B2647	751602 panel, 0 - 100psi, 50 - 120°C
B2643	751603 panel, as 751602 plus 0 - 20 bar pump pressure Swichgage®

MURPHY

FW Murphy
PO Box 470248
Tulsa, Oklahoma 74147, USA
tel: +1 918 317 4100
fax: +1 918 317 4266
email: sales@fwmurphy.com
web: www.fwmurphy.com

CONTROL SYSTEMS AND SERVICES DIVISION
PO Box 1819, Rosenberg, Texas 77471, USA
tel: +1 281 633 4500
fax: +1 281 633 4588
email: sales@fwmurphy.com

MURPHY DE MEXICO S.A. DE C.V.
Blvd. Antonio Rocha Cordero 300, Fracción del Aguaje
San Luis Potosí, S.L.P. México 78384
tel: +52 444 8206264
fax: +52 444 8206336
Villahermosa office tel: +52 993 3162117
email: ventasmex@murphymex.com.mx
web: www.murphymex.com.mx

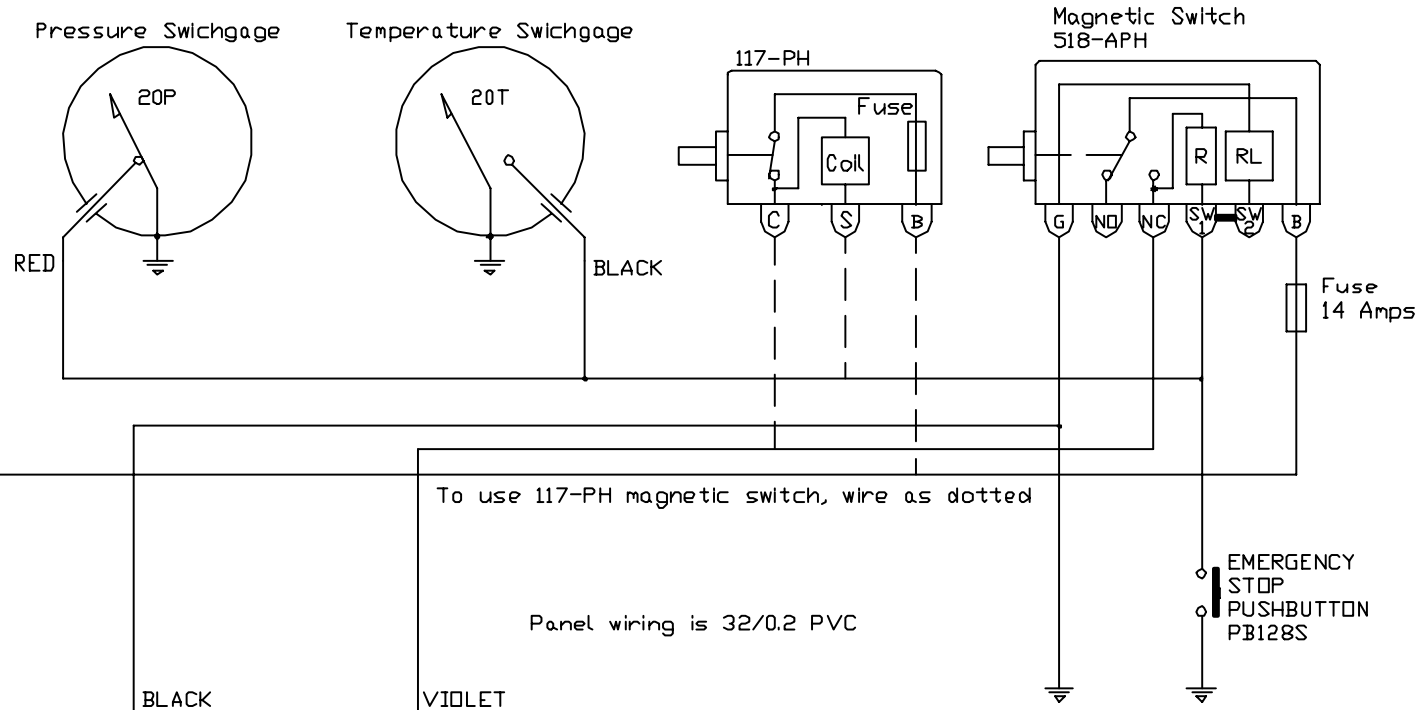
FRANK W. MURPHY LTD.
Church Rd, Laverstock, Salisbury, SP1 1QZ, UK
tel: +44 1722 410055
fax: +44 1722 410088
email: sales@fwmurphy.co.uk
web: www.fwmurphy.co.uk

MURPHY SWITCH OF CALIFORNIA
41343 12th Street West,
Palmdale, CA 93551-1442, USA
tel: +1 661 272 4700
fax: +1 661 947 7570
email: sales@murphyswitch.com
web: www.murphyswitch.com

MACQUARRIE CORPORATION
1620 Hume Highway,
Campbellfield, Victoria 3061, Australia
tel: +61 3 9358 5555
fax: +61 3 9358 5558
email: murphy@macquarrie.com.au

USA - ISO9001:2000 FM 28221
UK - ISO9001:2000 FM 29422

IF IN DOUBT ASK



3 off male bullet connectors (68.BT.0040) crimped to leads from panel, length 20cm
3 off female bullet connectors (68.BT.1040) attached for customer wiring
Connect both 20P7HL tails (Red) direct to E/Stop pushbutton and link direct to magnetic switch 'S' terminal
Connect 20P tail (Red) and 20T tail (Black) direct to magnetic switch 'S' terminal

FRANK W MURPHY LTD
SWICHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
TELEPHONE 01722 410055
FAX 01722 410088
TELEX 477088

REV	REVISION DETAILS	DATE	NAME

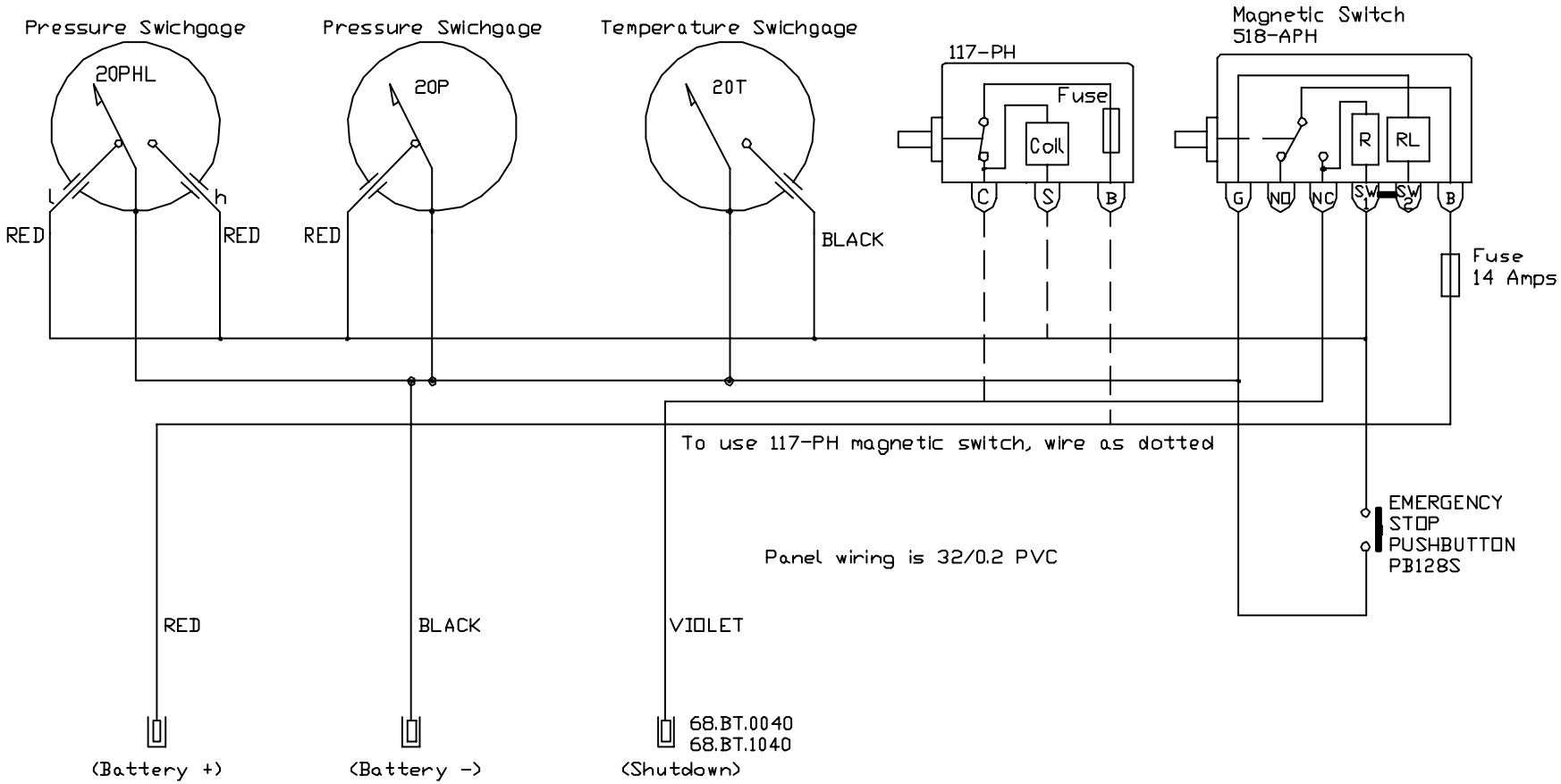
Customer
Murphy works order number

MAT. n/a
FINISH n/a
SCALE n/a
DRAWN G. REES
DATE 20/5/97

TITLE
751602
Wiring Diagram

DRAWING No
ZE2649

IF IN DOUBT ASK



3 off male bullet connectors (68.BT.0040) crimped to leads from panel, length 20cm
3 off female bullet connectors (68.BT.1040) attached for customer wiring

Connect both 20P7HL tails (Red) direct to E/Stop pushbutton and link direct to magnetic switch 'S' terminal

Connect 20P tail (Red) and 20T tail (Black) direct to magnetic switch 'S' terminal

THIS IS AN ENERGISE TO RUN SYSTEM

FRANK W MURPHY LTD
SWICHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
TELEPHONE 01722 410055
FAX 01722 410088
TELEX 477088

REV	REVISION DETAILS	DATE	NAME	CHECK
A	Removed 20P7HL due to PIN88	22/7/99	ML	

Customer
Murphy works order number

DRAWN G. REES
CHECKED
DATE 12/5/97

TITLE
751603 Wiring Diagram

DRAWING No
ZE2613

WD100/WD270 series
Engine and Pump Protection Panels

ss6349
revision B, 24th November 2003
catalogue section 30

- **Engine and pump protection for mobile or stationary applications**
- **Swichgage® indication and automatic shutdown**
- **Instant shutdown or warning before shutdown**
- **Compact and easy to install**

Description

The WD100 and WD270 series panels are a rugged, dependable solution for engine or pump fault protection. Their compact size and ease of installation make these panels highly suited to the protection of mobile or stationary engine-driven applications such as tractors, PTO devices, earth moving equipment and pumps.

WD series panels use the accurate and reliable Murphy Swichgage® for indication and fault shutdown. All WD panels feature Swichgages for oil pressure (0 - 100psi / 0 – 7 bar) and coolant temperature (50 – 120°C). Options are also available for indication/shutdown of pump water pressure (0 – 20 Bar), oil temperature (60 – 140°C) and auxiliary contact shutdown: see 'how to order' overleaf for a full feature reference.

Each panel uses a robust steel, black painted enclosure, fitted with a rotating bracket for ease of installation and use. Mobile equipment warning-before-shutdown versions (WD107/277) are also fitted with a Murphy Selectronic® TL7 flashing alarm light and SAH mini-siren, both of which activate on fault, 30 seconds before an automatic shutdown.

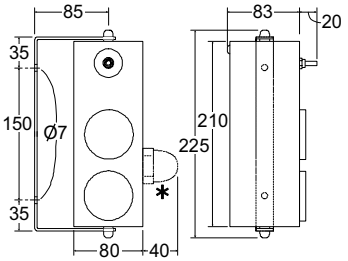
Standard panels are supplied complete with a 2 metre oil line and adaptors, 3 crimped wires for electrical connection (battery positive, battery negative and fuel/shutdown output) and a wiring diagram. The WD series is designed for use on 12VDC engines with energised-to-run type fuel solenoids.

Warranty

A two year limited warranty on materials and workmanship is given with this Murphy product. Details are available at **www.fwmurphy.co.uk/warranty**.

Dimensions

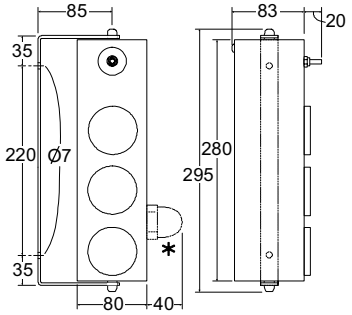
WD100/107



∗ TL7 flashing alarm on WD107 only.

Panel/Swichgage® orientation:-
- vertical in WD100
- horizontal in WD107

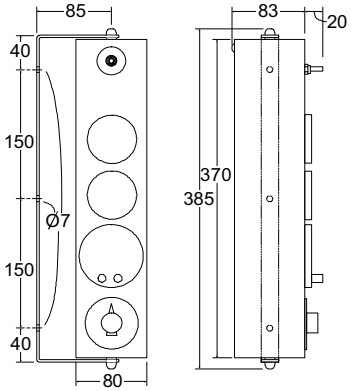
WD270/WD277



∗ TL7 flashing alarm on WD277 only.

Panel/Swichgage® orientation:-
- vertical in WD270
- horizontal in WD277

WD275



Operation

WD100
General engine protection, instant fault shutdown

While starting the engine, hold in the 518APH reset button until the engine starts and the Swichgage® low oil pressure contact clears.

As soon as a low oil pressure or high coolant temperature fault occurs, the WD100 will immediately shut down the engine. Rectify the fault causing shutdown, then resume operation.

WD270
Pump applications, instant fault shutdown

Starting

Method 1: hold in the 518APH reset button then start the engine as normal. The reset button may be released when both engine oil pressure and pump pressure have increased above the Swichgages' low limit set points.

Method 2: Before engine starting, temporarily set the low water pressure Swichgage® contact to minimum (so that the contact is open circuit). Press and hold the 518APH reset button during engine starting, then release the reset button once the engine starts and the Swichgage® low oil pressure contact clears. Monitor the pump water pressure until it rises above the low pressure shutdown level, then raise the Swichgage® contact to this low pressure limit.

Running / fault shutdown

As soon as an engine pressure/temperature or pump pressure fault occurs, the WD270 will immediately shut down the engine. Rectify the fault causing shutdown, then resume operation.

WD275
Pump applications, instant shutdown, adjustable timed lockout of low pump pressure on startup

Turn the low pump pressure lockout timer to the required time (0 – 15 minutes), hold in the 518APH reset button, then start the engine. The reset button may be released once the engine has started and the Swichgage® low oil pressure contact has cleared.

Engine low oil pressure, engine high coolant temperature and pump high pressure faults will then cause an immediate engine shutdown. Once the set lockout time has expired, a pump low pressure fault will also cause an engine shutdown. Rectify the fault causing shutdown, then resume operation.

WD107/WD277
Mobile applications, warning before shutdown, auto override of low pump pressure on startup

Start the engine in the normal manner. The red light (TL7) will flash and the Mini-Siren® will sound until the engine starts and lifts the Swichgage® low oil pressure contact.

If the red light comes on or the Mini-Siren® sounds during normal driving it is a warning to shut down the engine as quickly as possible. Otherwise, the panel will shut down the engine automatically within 30 seconds.

After an automatic shutdown, the engine may be restarted in the normal way, but will only run for 30 seconds.

Once the vehicle has been safely stopped, rectify the engine fault then resume normal operation.

How to order

Please select the stock number below based on the features required:-

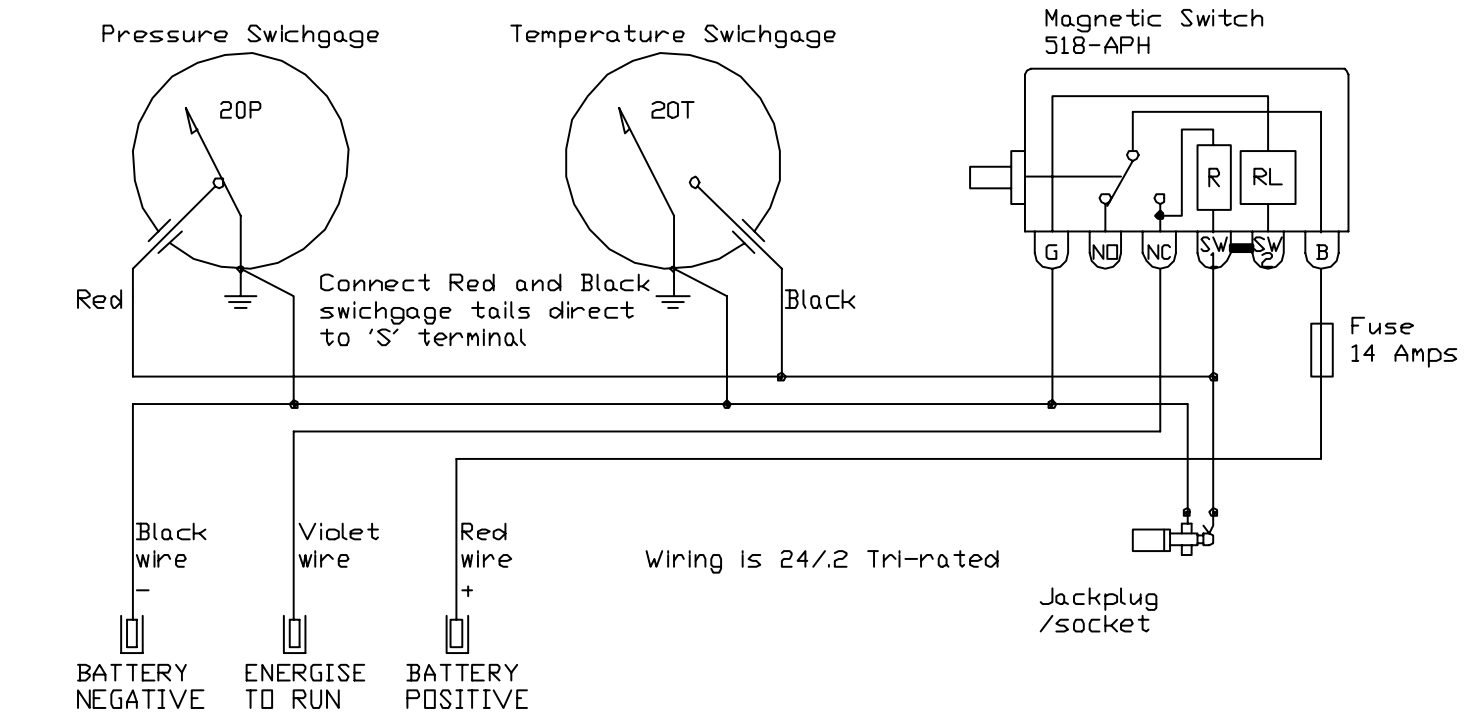
Stock number	Panel type	Supply volts (VDC)	Magnetic shutdown switch	20P oil pressure Swichgage® (0 - 100psi / 0 - 7 bar)	Oil line, 2m	20T coolant temperature Swichgage® (50 - 120°C) with 2m capillary	20T oil temperature Swichgage® (60 - 140°C) with 2m capillary	Socket & jackplug auxiliary shutdown input	Manual lockout of engine fault on startup	Automatic lockout of engine fault on startup	High/low pump pressure Swichgage® (0 - 20 Bar) with 3m utility line	Manual lockout of low pump pressure on startup	Adjustable 0 - 15 minute lockout of low pump pressure on startup	Instant fault shutdown	Warning before shutdown (flashing lamp and mini-siren)
B2644	WD100	12	✓	✓	✓	✓	✘	✓	✓	✘	✘	n/a	n/a	✓	✘
B2880	WD107	12	✓	✓	✓	✓	✘	✓	✘	✓	✘	n/a	n/a	✘	✓
B6407	WD107	12	✓	✓	✘	✓	✘	✓	✘	✓	✘	n/a	n/a	✘	✓
B2842	WD270	12	✓	✓	✓	✓	✘	✘	✓	✘	✓	✓	✘	✓	✘
B5918	WD275	12	✓	✓	✓	✓	✘	✘	✓	✘	✓	✘	✓	✓	✘
B6300	WD277	12	✓	✓	✓	✓	✓	✘	✘	✓	✘	n/a	n/a	✘	✓

MURPHY

FRANK W MURPHY LTD.
Church Road, Laverstock, Salisbury, SP1 1QZ, United Kingdom
tel: +44 (0)1722 410055 **fax:** +44 (0)1722 410088
email: sales@fwmurphy.co.uk **web:** www.fwmurphy.co.uk

USA - ISO9001:2000 FM 28221
UK - ISO9001:2000 FM 29422

IF IN DOUBT ASK



3 off male bullet connectors (68.BT.0040) crimped to leads from panel, length 20cm

3 off female bullet connectors (68.BT.1040) attached for customer wiring

19

FRANK W Murphy LTD
SWICHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
TELEPHONE 01722 410055
FAX 01722 410088
TELEX 477088

REV	REVISION DETAILS	DATE	NAME

Customer

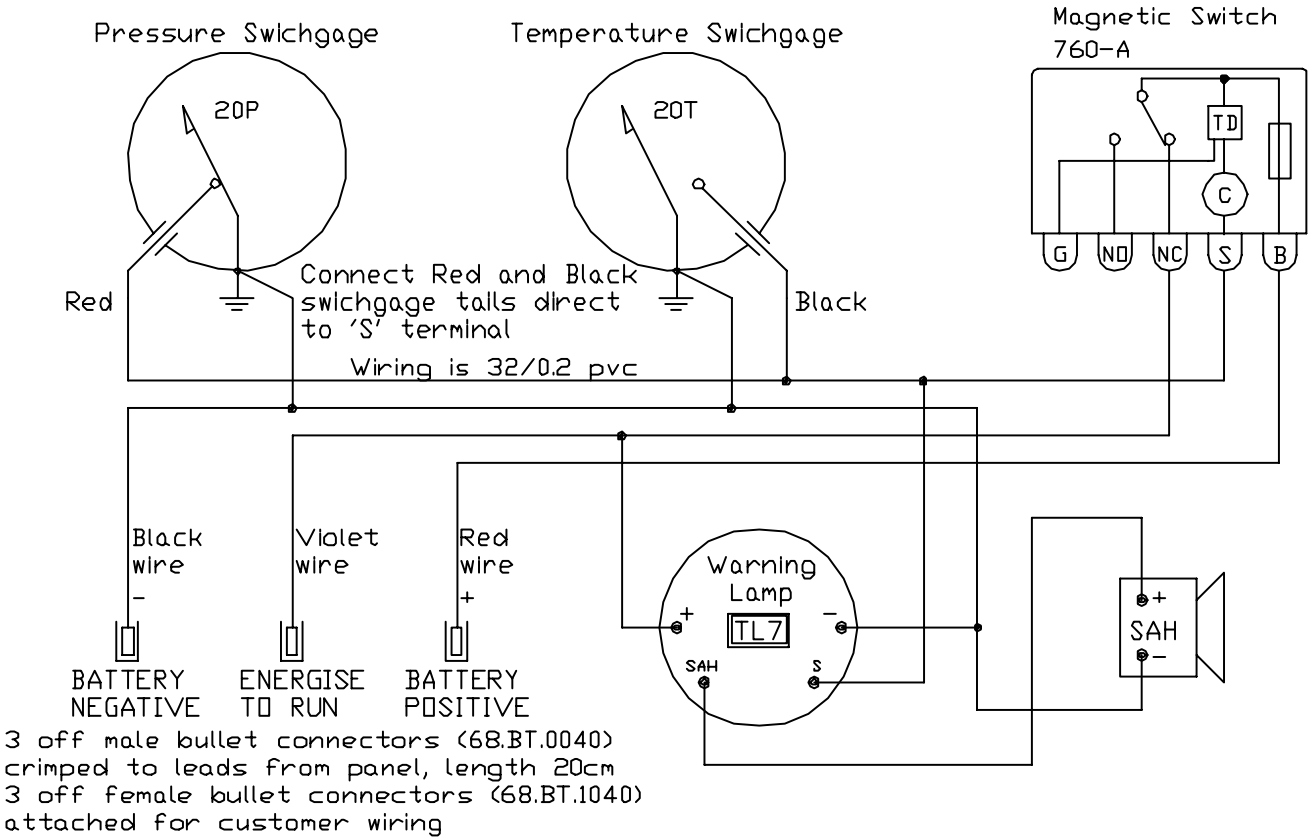
Murphy works order number

MAT.	n/a
FINISH	n/a
SCALE	n/a
DRAWN	G. REES
DATE	20/5/97

TITLE
WD100 Diagnostic Centre 12V

DRAWING No
TE2645

IF IN DOUBT ASK



3 off male bullet connectors (68.BT.0040)
crimped to leads from panel, length 20cm
3 off female bullet connectors (68.BT.1040)
attached for customer wiring

Cut off terminal marked 'PULSE' from back of SAH unit
Use only insulated receptacles, 91.12.0404 on TL7 terminals
Ensure TL7/SAH terminals do not foul swichgages

FRANK W MURPHY LTD
SWICHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
TELEPHONE 01722 410055
FAX 01722 410088
TELEX 477088

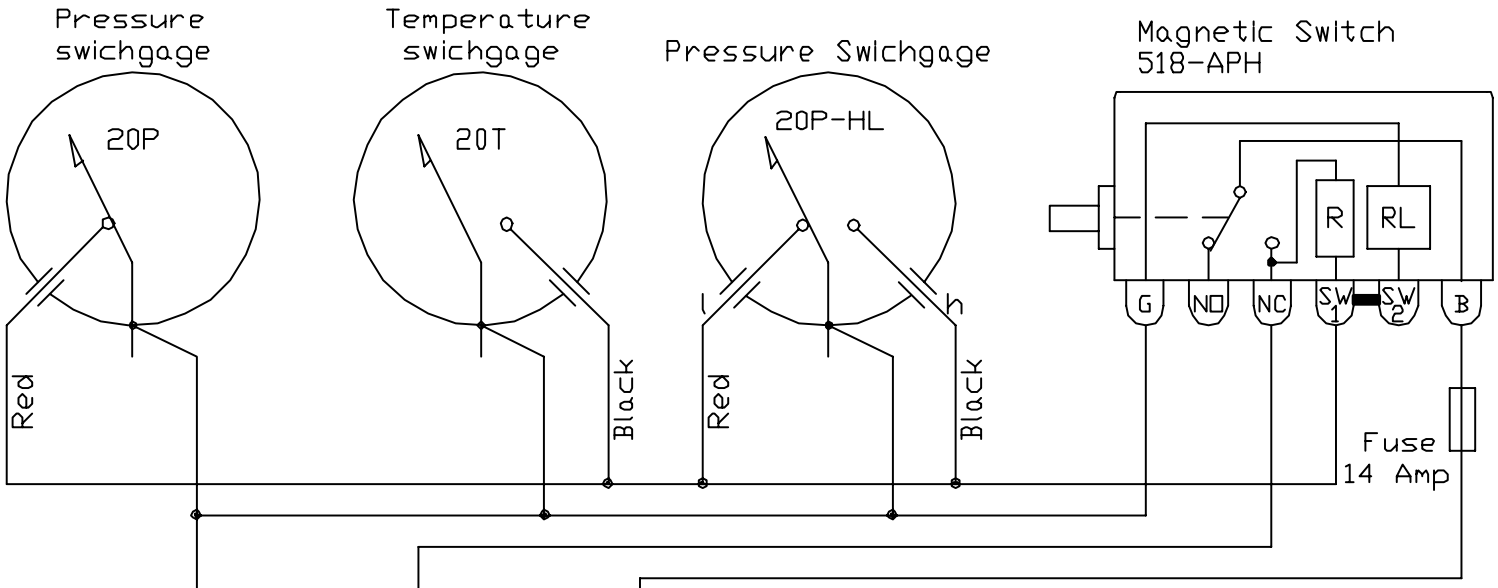
REV	REVISION DETAILS	DATE	NAME	CHECK

Customer	DRAWN G. REES
Murphy works order number	CHECKED
	DATE 20/5/97

TITLE
WD107 Series
Diagnostic Centre

DRAWING No
TE2641

IF IN DOUBT ASK



Black wire −

Violet wire

Red wire +

BATTERY NEGATIVE

ENERGISE TO RUN

BATTERY POSITIVE

Wiring is 32/0.2 PVC

Connect Red and Black swichgage tails direct to 'S' terminal

3 off male bullet connectors (68.BT.0040) crimped to leads from panel, length 20cm
3 off female bullet connectors (68.BT.1040) attached for customer wiring

REV	REVISION DETAILS	DATE	NAME	CHECK
A	Changed 20P7-LH	20/08/99	DPE	

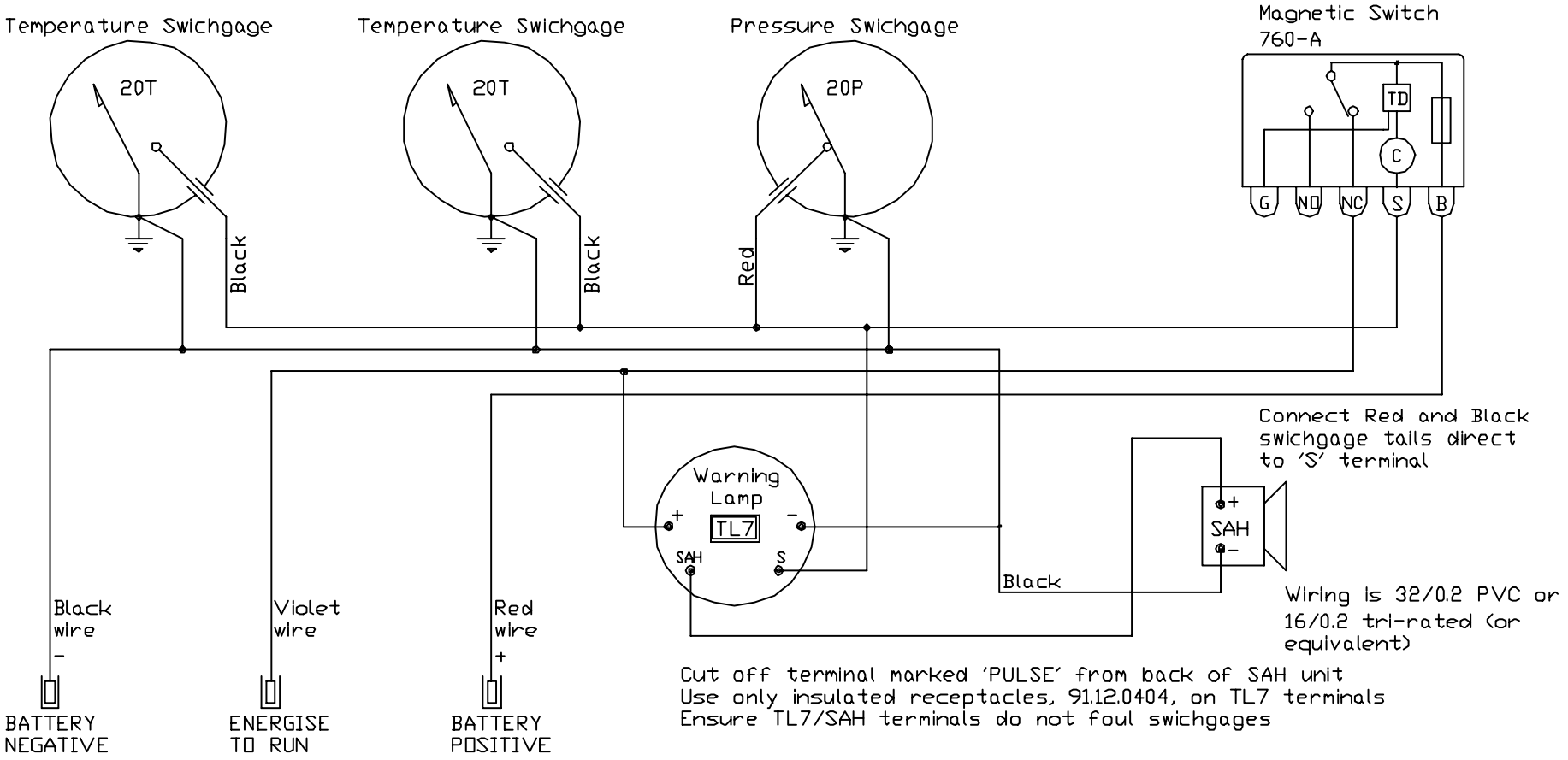
Customer	DRAWN G. REES
Murphy works order number	CHECKED
	DATE 14/5/97

FRANK W MURPHY LTD
SWICHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
TELEPHONE 01722 410055
FAX 01722 410088
TELEX 477088

TITLE
WD270 Wiring Diagram

DRAWING No
TE2632

IF IN DOUBT ASK



FRANK W MURPHY LTD
SWICHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
TELEPHONE 01722 410055
FAX 01722 410088
TELEX 477088

REV	REVISION DETAILS	DATE	NAME

Customer

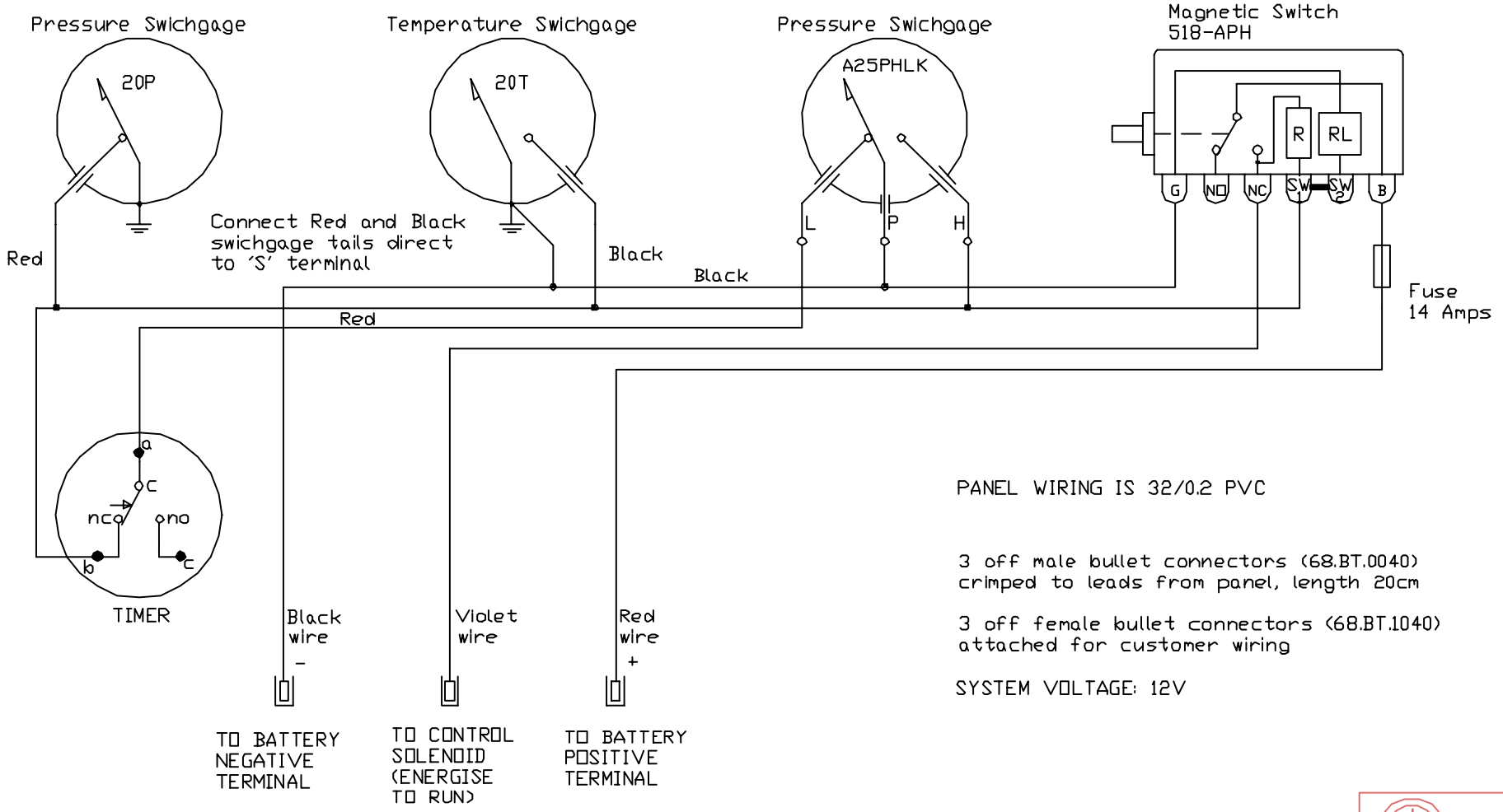
Murphy works order number

MAT.	n/a
FINISH	n/a
SCALE	n/a
DRAWN	P. GILBEY
DATE	20/10/97

TITLE
WD277
Circuit Diagram

DRAWING No
TE3154

IF IN DOUBT ASK



PANEL WIRING IS 32/0.2 PVC

3 off male bullet connectors (68.BT.0040)
crimped to leads from panel, length 20cm

3 off female bullet connectors (68.BT.1040)
attached for customer wiring

SYSTEM VOLTAGE: 12V

SWITCHGAGE HOUSE, CHURCH ROAD, LAVERSTOCK,
WILTSHIRE, SALISBURY, ENGLAND, SP1 1QZ.
TELEPHONE +44 1722 410055
FAX +44 1722 410088
e-mail sales@fwmurphy.co.uk
Visit Our Web Site At -
www.fwmurphy.co.uk

REV	REVISION DETAILS	DATE	NAME

MAT.	N/A
FINISH	N/A
SCALE	NTS
DRAWN	AS
DATE	04/05/00

Tolerancing
Linear Dimensions
Nominal dimensions in mm

0.5 to 6	6 to 30	30 to 120	120 to 315	315 to 1000	1000 to 2000	2000 to 4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2

TITLE
WD275-12V

DRAWING No
TE5919

B6455 Autostart Pump Panel

ss6414
revision A, 1st March 2006
catalogue section 30

- **Auto pump start/stop from high and low float contacts**
- **Engine fault shutdown protection and indication**
- **Engine speed tachometer and overspeed protection**
- **IP54 weatherproof enclosure**

Description

Panel B6455 provides automatic or manual control, instrumentation and protection for 12V DC diesel-driven pumps. The panel includes:-

- Sheet steel, black-painted, IP54 enclosure
- Murphy ASM170 control module with customised program, for engine auto start/stop and fault protection. Includes LED indicators: (low) oil pressure, (high) engine temperature, failed to start, overspeed, engine running, preheat.
- Security keyswitch, Manual–Off–Auto
- Murphy ATHS-30-12-C combined tacho and hourmeter
- Charge alternator lamp, for alternator excitation and failure warning.
- Power supply fuse holder and 10A fuse.
- Integral 10-way, 700mm wiring harness for engine control connections.
- 2 x 4-way sockets on the front facia (complete with removable weatherproof covers) for connection of auto start and auto stop float level switches. 2 x 4-way plugs (complete with removable weatherproof covers) are supplied loose for use on the float switch wiring harness.

Operator control is through the Manual-Off-Auto keyswitch:-

Manual	Gives an immediate, automatic start of the pump and continuous running.
Off	Removes power the ASM170 control module, giving an immediate engine stop or fault reset.
Auto	Pump auto start/stop controlled by remote float level switches. Default set-up is for auto start and auto stop by separate, momentary closing remote contacts, but ASM170 can be configured for use with a single closed-to-start, open-to-stop contact.

Product specification

Power supply:	
operating voltage: ASM170 controller ATHS tachourmeter	12V DC nominal 6 to 16 VDC continuous 11.6 to 16 VDC continuous
current consumption: standby (typ) cranking (typ)	*(N.B. excludes output load)* 7 mA @ 12V 250 mA @ 12V
Inputs:	
engine low oil pressure & high coolant temperature	closed to negative DC on fault
magnetic pickup voltage range:-	1.5 – 14.4 V AC rms
autostart and autostop	momentary closed to start/stop
Outputs:	*(all ratings for resistive load)*
fuel	positive DC, smart-FET, 10A max, for 'energised to run' fuel controls
preheat and crank	positive DC, switched relay, 5A max per output
combined output (fuel, preheat and crank)	10A max, protected by replaceable supply fuse
Settings:	
crank/rest time (ASM pot R1)	10 secs (adjustable 1 - 25 sec)
crank attempts (ASM switches)	3 (adjustable to 5, 10 or 255)
lockout delay (ASM pot R5)	10 secs (adjustable 1 – 300 sec)
minimum run time (ASM pot R4)	5 mins (adjustable 0 – 60 mins)
crank release freq. (ASM pot R3)	13 – 2300 Hz
overspeed freq. (ASM pot R2)	13 – 8500 Hz
tachometer calibration	70 to 225 teeth (pulses per rev)
Physical:	
overall dimensions (W x H x D)	170 x 250 x 165 mm
approx. weight	2.7 Kg
operating ambient temperature	–10 to +55 °C
Accessories (supplied loose):	
magnetic pickup 68.MP.0060	thread: M16 x 1.5 length: 48mm connection: 6mm spade
preheat slave relay	SPNO relay, max 60A @ 12 VDC
starter slave relay	SPDT relay, max 30A @ 12 VDC

The ASM170 control module gives an automatic (starter motor) crank release in both manual and automatic start modes, using a flywheel/gearwheel mounted magnetic pickup to sense engine speed. Pickup model 68.MP.0060 is supplied loose with each panel.

The automatic engine start sequence comprises:-

- 3 crank attempts (adjustable to 5, 10 or 255)
- 6 second preheat (non-adjustable)
- 10 sec crank/rest time (adjustable 1 to 25 secs)

If the module fails to sense engine speed after the set number of start attempts, a Failed To Start fault is signalled.

The magnetic pickup circuit also feeds the ATHS tacho/ hourmeter. Tachometer calibration, and the ASM170 crank release and overspeed shutdown levels, must be set during panel commissioning.

Engine low oil pressure and high engine temperature faults are sensed by connection of remote fault switch or Murphy Swichgage contacts (not supplied), closing to negative DC during fault.

The following are supplied loose with each panel:-

- 1 x 60 Amp (preheat) and 1 x 30 Amp (starter solenoid) slave relays, for external connection when preheat and crank solenoid loads exceed the panel outputs' 5 Amp ratings.
- 68.MP.0060 magnetic pickup, for speed sensing
- 2 x 4-way connectors with terminal covers, for use in the float switch wiring harness.
- Circuit diagram and product specification

Warranty

A two year limited warranty on materials and workmanship is given with this product. Full details are available at **www.fwmurphy.co.uk/warranty**

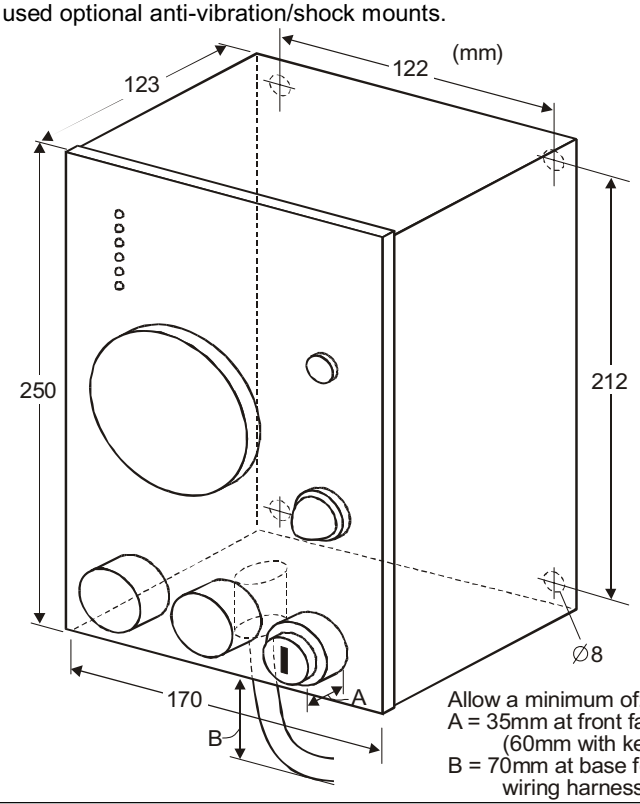
Electrical connection

Panel-to-engine electrical connection is via a 10-way, 700mm wiring harness with numbered leads as detailed below. A full wiring diagram (SE6448) is supplied with each panel:-

1	Battery positive power supply, 12 VDC (10A max)
2	Battery negative power supply
3	Crank output, positive DC (5A max.)
4	Preheat output, positive DC (5A max.)
5	Fuel output, positive DC (10A max.)
6	Charge alternator WL
7	Magnetic pickup speed input positive
8	Low oil pressure input, closed to negative on fault
9	High engine temperature, closed to negative on fault
15	Magnetic pickup speed input negative

Dimensions

Position the panel in a location that minimises extremes of temperature or ingress of moisture and dust/dirt. Where required, used optional anti-vibration/shock mounts.



How to order

stock code	*model / description*
B6455	Pump control panel, supplied complete with magnetic pickup, slave relays and wiring harness connectors.
Accessories:-	
91.12.0038	Optional shockmounts, ¼" UNC (up to 4 may be required)
60.WS.2162	Magnetic pickup screen cable, per metre

Further information

document	*description*
SE6448	B6455 circuit diagram
ASM-03021B	ASM170 control module sales bulletin
ASM-03024N	ASM170 control module installation
TAH-97026B	AT series tachometers sales bulletin
TAH-97029N	AT series tachometers installation
ys6336	magnetic pickup sales bulletin
MP-8802N	magnetic pickup installation

Full information for the above and other products is available at **www.fwmurphy.co.uk/products**

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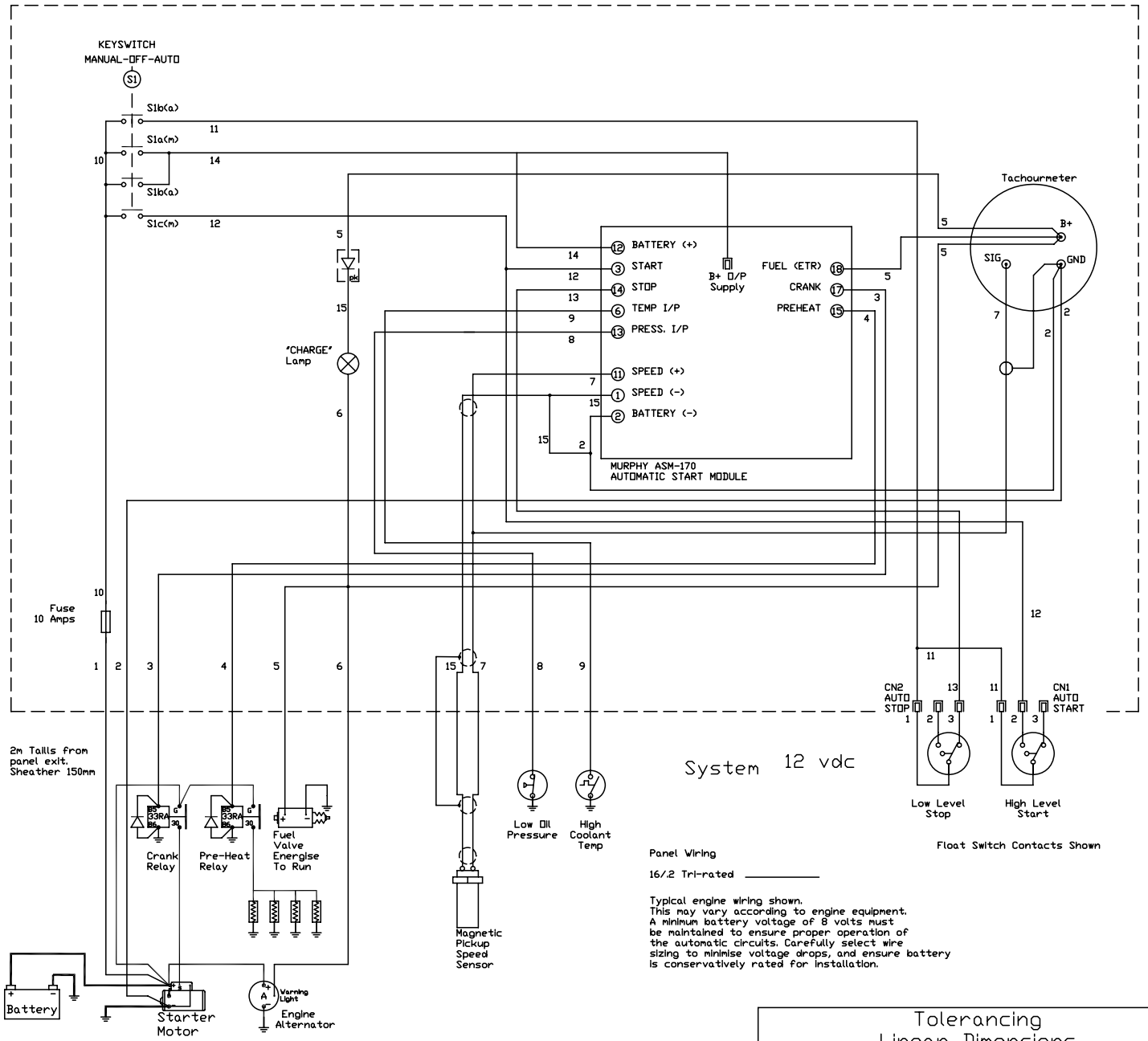
USA - ISO9001:2000 FM 28221
UK - ISO9001:2000 FM 29422

In order to consistently bring you the highest quality, full featured products, we reserve the right to change our specifications and designs at any time.

IF IN DOUBT ASK



27

REV	REVISION DETAILS	DATE	NAME
A	Added link from2 to 15	25/04/05	GAD

MAT.	N/A
FINISH	N/A
SCALE	NTS
DRAWN	GAD
DATE	07/04/05

Tolerancing
Linear Dimensions
Nominal dimensions in mm

0.5 to 6	6 to 30	30 to 120	120 to 315	315 to 1000	1000 to 2000	2000 to 4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2

FRANK W. murphy LTD
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FAX +44 1722 410088
e-mail sales@fwmurphy.co.uk
Visit Our Web Site At -
www.fwmurphy.co.uk

TITLE
Auto Engine Pump Controller Schematic

DRAWING No
SE6448

Section 2 – Non-standard panels

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Panel Specification

Stock code: **B0636**
Panel type: **Diagnostic Centre, 24V**
Circuit reference: **SE0640**

The Diagnostic Centre is for control and protection of an engine. It is designed to operate with an engine fitted with a 24 Volt battery starting system and an energise-to-run fuel control system.

Starting is manually initiated by means of an Off-On-Heat-Heat/Start keyswitch, as follows:-

Off Move the keyswitch to Off and the engine will shutdown.
On Move the keyswitch to the On position and the fuel solenoid output is energised.
Heat Move the keyswitch to the Heat position and the pre-heater solenoid output is energised.
Heat Start Move the keyswitch to the Heat Start position and the pre-heater solenoid and starter motor solenoid outputs are energised.

The starting sequence will be as follows:-

a) The operator should discontinue cranking (by releasing the keyswitch) should be discontinued as soon as the engine starts.

b) There is a 30 second start up lock out delay and then the engine is monitored for the following shutdown faults :-

i) Low oil pressure
ii) Low oil level (customer supplied switch, close on fault)
iii) High coolant temperature
iv) Low coolant level (customer supplied switch, close on fault)
v) Engine overspeed

In the event of any of the above faults, the relevant shutdown lamp is illuminated giving first out indication and the tattletale on the front panel will actuate and the engine will shutdown. The tattletale will require resetting before normal operation can be resumed.

An alternator warning light is provided on the front panel for indication of battery charging alternator fault.

An EG21 voltmeter, 24V is installed to monitor the battery voltage.

An oil pressure Swichgage 20PI 100 PSI is installed in the front panel for indication and shutdown. A suitable 3.0 metre premium quality oil line will also be supplied loose.

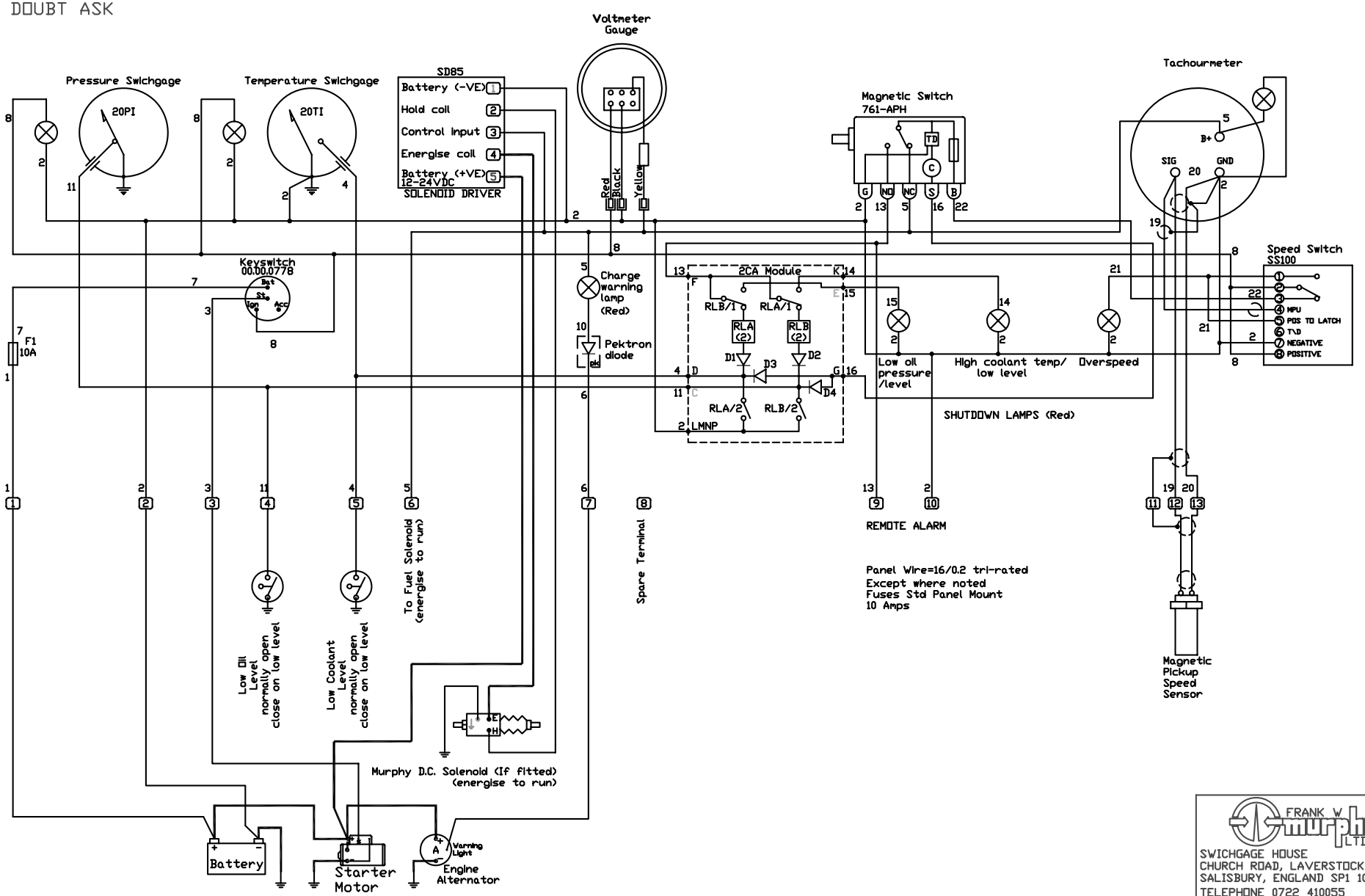
A coolant temperature Swichgage 20TI 120C is installed in the front panel for indication and shutdown. This is supplied complete with 3.0 metres of capillary.

A SS300 speed switch is installed for overspeed shutdown.

A tachoursrun counter ATHS-30-12-C is installed in the front panel to indicate engine RPM and to record total engine running hours.

A magnetic pickup is supplied loose complete with 3 metres of shielded cable. This should be installed into the engine fly-wheel housing, and provides engine speed information to the Diagnostic Centre.

IF IN DOUBT ASK



REV	REVISION DETAILS	DATE	NAME	CHECK
E	CHANGE EG20 TO EG21	10/04/97	ML	
D	CHANGES AS AMN1 1356	8/9/95	PAG	
C	KS to 0778 MN1 1184	23/1/95	GR	
B	Test Mods	9/6/94	PAG	

Customer	DRAWN G. REES
Murphy works order number	CHECKED
	DATE 14/12/93

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TITLE
Diagnostic Centre Circuit Diagram

DRAWING No
SE0640

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ss6353
14th April 2003
catalog section 30

Panel Specification

Stock code: **B2900**
Panel type: **Diagnostic Centre, 12V**
Circuit reference: **1E2903**

The Diagnostic Centre is for control and protection of an engine. It is designed to operate with an engine fitted with a 12 Volt battery starting system and an energise to run fuel control system.

Starting may be initiated by means of an Off-On-Heat-Heat Start keyswitch, as follows:-

Off Move the keyswitch to Off and the engine will shutdown.

On Move the keyswitch to the On position and the fuel solenoid output is energised.

Heat Move the keyswitch to the Heat position and the pre-heater solenoid output is energised.

Heat Start Move the keyswitch to the Heat Start position and the pre-heater solenoid and starter motor solenoid outputs are energised.

The starting sequence will be as follows :-

a) Cranking should be discontinued as soon as the engine starts.
b) The engine is monitored for the following shutdown faults :-
   i) Low oil pressure ①
   ii) High coolant temperature ①

① Customer supplied switch, normally open, closing to battery negative on fault.

In the event of any of the above faults, the tattletale on the front panel will actuate and the engine will shutdown. The tattletale will require resetting before normal operation can be resumed.

An hoursrun counter is installed in the front panel to record total engine running hours.

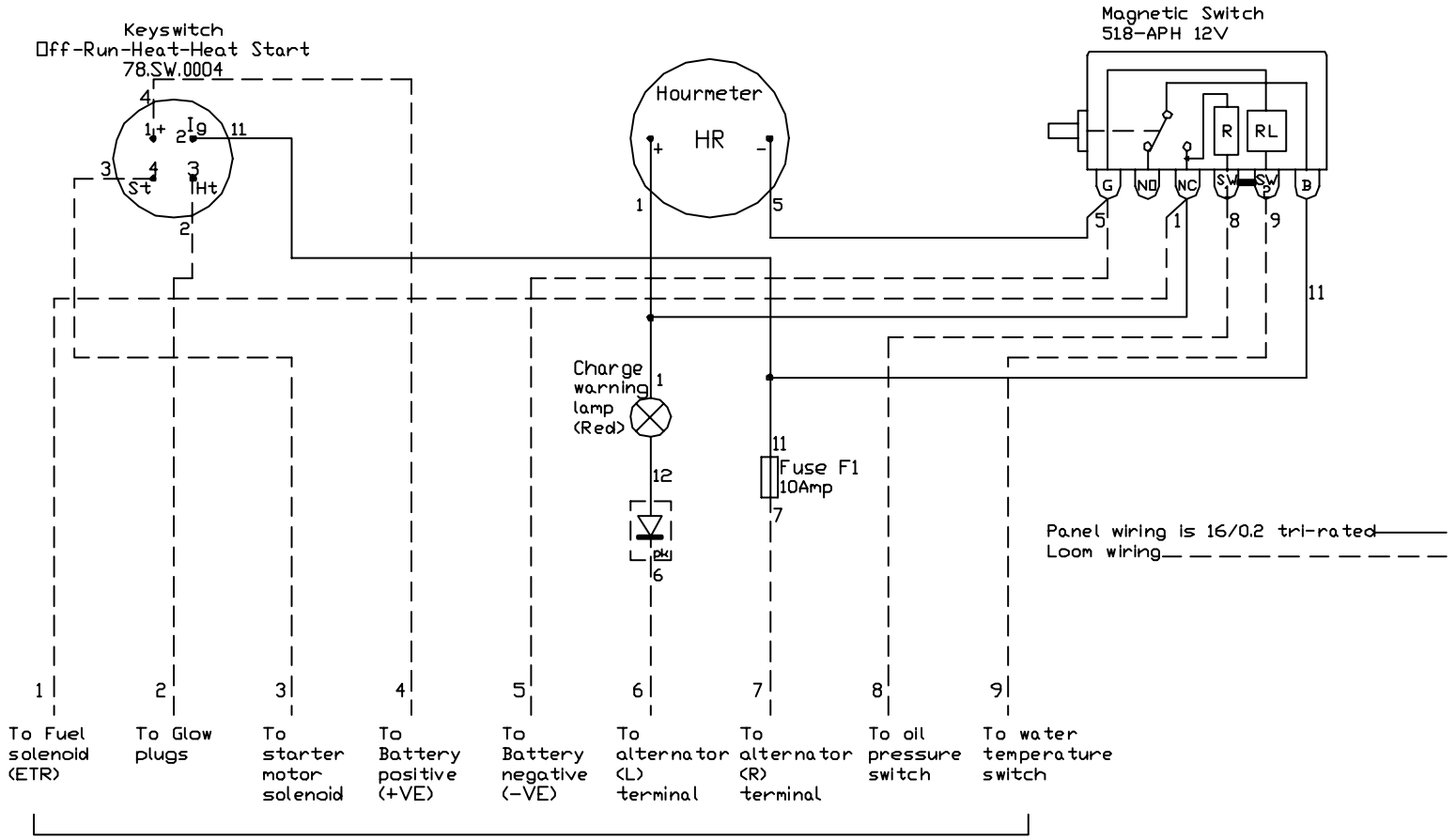
An alternator warning light is provided on the front panel for indication of battery charging alternator fault.

The controller features a sheet steel enclosure, finished in black. Anti-vibration mountings are provided for mounting on a bulkhead, or on a suitable engine skid framework and should be used where appropriate to avoid subjecting the controller to engine vibration.

External connections are made to a clearly labelled wiring harness.

Free issue components required are as follows :-

- Temperature Switch Crimp And Receptacle (Part Number: 385620270, Supplier: Perkins)
- Alternator Plug (Part Number: 385620290, Supplier: Perkins)



For harness details, refer to 1H2904

SYSTEM VOLTAGE IS 12VDC NEG EARTH

REV	REVISION DETAILS	DATE	NAME
B	Remove F2 nolanger required	12/02/01	NL
A	Remove earth from HM	18/5/98	PAG

IF IN DOUBT ASK

Authorised

Customer H.J. GODWIN

Murphy works order number N/A

MAT. N/A
FINISH N/A
SCALE N/A
DRAWN M.LOUGH
DATE 29/07/97

FRANK W. MURPHY LTD
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TELEX 477188

TITLE
DIAGNOSTIC CENTRE 12V

DRAWING NO
1E2903

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ss6354
14th April 2003
catalog section 30

Panel Specification

Stock code: **B2935**
Panel type: **Diagnostic Centre, 12V**
Circuit reference: **5E2858**

The Diagnostic Centre is for control and protection of an engine. It is designed to operate with an engine fitted with a 12 Volt battery starting system and an energise-to-run fuel control system.

Starting may be initiated by means of an Off-On-Heat-Heat Start keyswitch, as follows:-

Off Move the keyswitch to Off and the engine will shutdown.

On Move the keyswitch to the On position and the fuel solenoid output is energised.

Heat Move the keyswitch to the Heat position and the pre-heater solenoid output is energised.

Heat Start Move the keyswitch to the Heat Start position and the pre-heater solenoid and starter motor solenoid outputs are energised.

The starting sequence will be as follows:-

a) Cranking should be discontinued as soon as the engine starts.
b) The engine is monitored for the following shutdown faults:-
   i) Low oil pressure
   ii) High coolant temperature

In the event of any of the above faults, the tattletale on the front panel will actuate and the engine will shutdown. The tattletale will require resetting before normal operation can be resumed.

An oil pressure Swichgage 20P 100 PSI-B is installed in the front panel for indication and shutdown. A suitable 1.0 metre premium quality oil line will also be supplied loose.

A coolant temperature Swichgage 20T 120C-B is installed in the front panel for indication and shutdown. This will be complete with 2.0 metres of capillary.

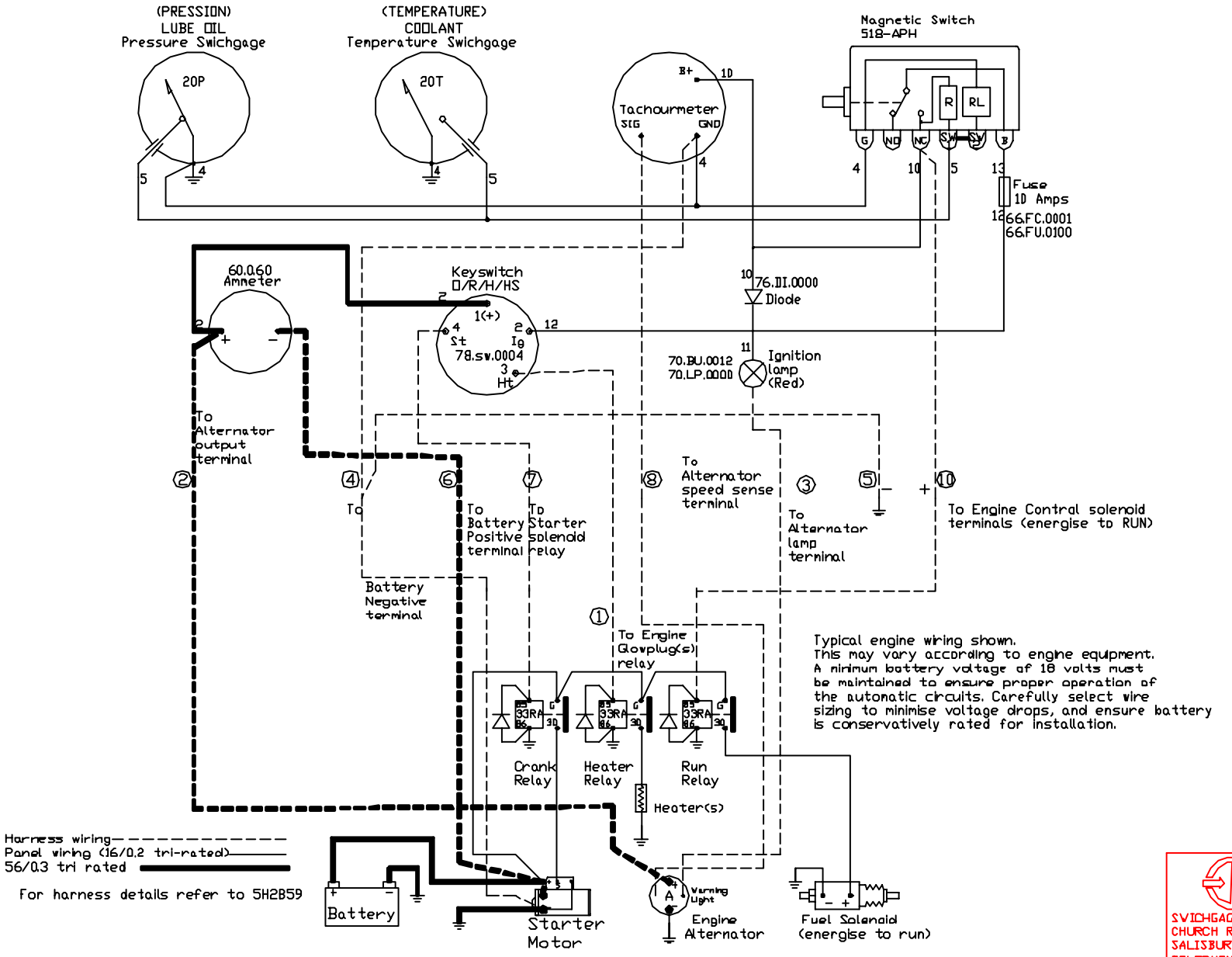
A tachoursrun counter ATHA-30-12-C is installed in the front panel to indicate engine RPM and to record total engine running hours.

A charge ammeter and alternator warning light are provided on the front panel for indication of battery charging alternator fault.

The controller features a sheet steel enclosure, finished in black. Anti-vibration mountings and a mounting bracket are provided for mounting on the engine, and should be used where appropriate to avoid subjecting the controller to engine vibration.

External connections are made through a gland in the base of the controller to a clearly labelled wiring harness.

IF IN DOUBT ASK



REV	REVISION DETAILS	DATE	NAME
C	Correction B+Alt Eng wires	15/03/02	GR
B	Changed to blade keyswitch	12/02/01	ML
A	UP RATED WIRE 2	17/06/98	ML

Customer

Murphy works order number

MAT. n/a
FINISH n/a
SCALE n/a
DRAWN M. LOUGH
DATE 17/7/97

FRANK W Murphy LTD
SWITCHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
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TELEX 477088

TITLE
Diagnostic Centre
Wiring Diagram

DRAWING No
5E2858

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ss6355
14th April 2003
catalog section 30

Panel Specification

Stock code: **B3079**
Panel type: **Marine monitoring panel, 24V**
Circuit reference: **5E3082**

The Diagnostic Centre is for control and monitoring of an engine. It is designed to operate with an engine fitted with a 24 Volt insulated return battery starting system.

Starting may be initiated by means of an Off-On-Start keyswitch, as follows:-

Off Move the keyswitch to Off and the engine will shutdown.
Start Move the keyswitch to the Start position and the starter motor solenoid output is energised.

The starting sequence will be as follows:-

a) Cranking should be discontinued as soon as the engine starts.
b) The engine is monitored for the following conditions :-
   i) Low oil pressure
   ii) High coolant temperature

In the event of any of the above faults, the relevant lamp will illuminate to warn of the condition.

An oil pressure Swichgage A20EO 100 PSI is installed in the front panel for indication and warning.

A coolant temperature Swichgage A20ESR 120C is installed in the front panel for indication and warning. This will be complete with 3.0 metres of capillary.

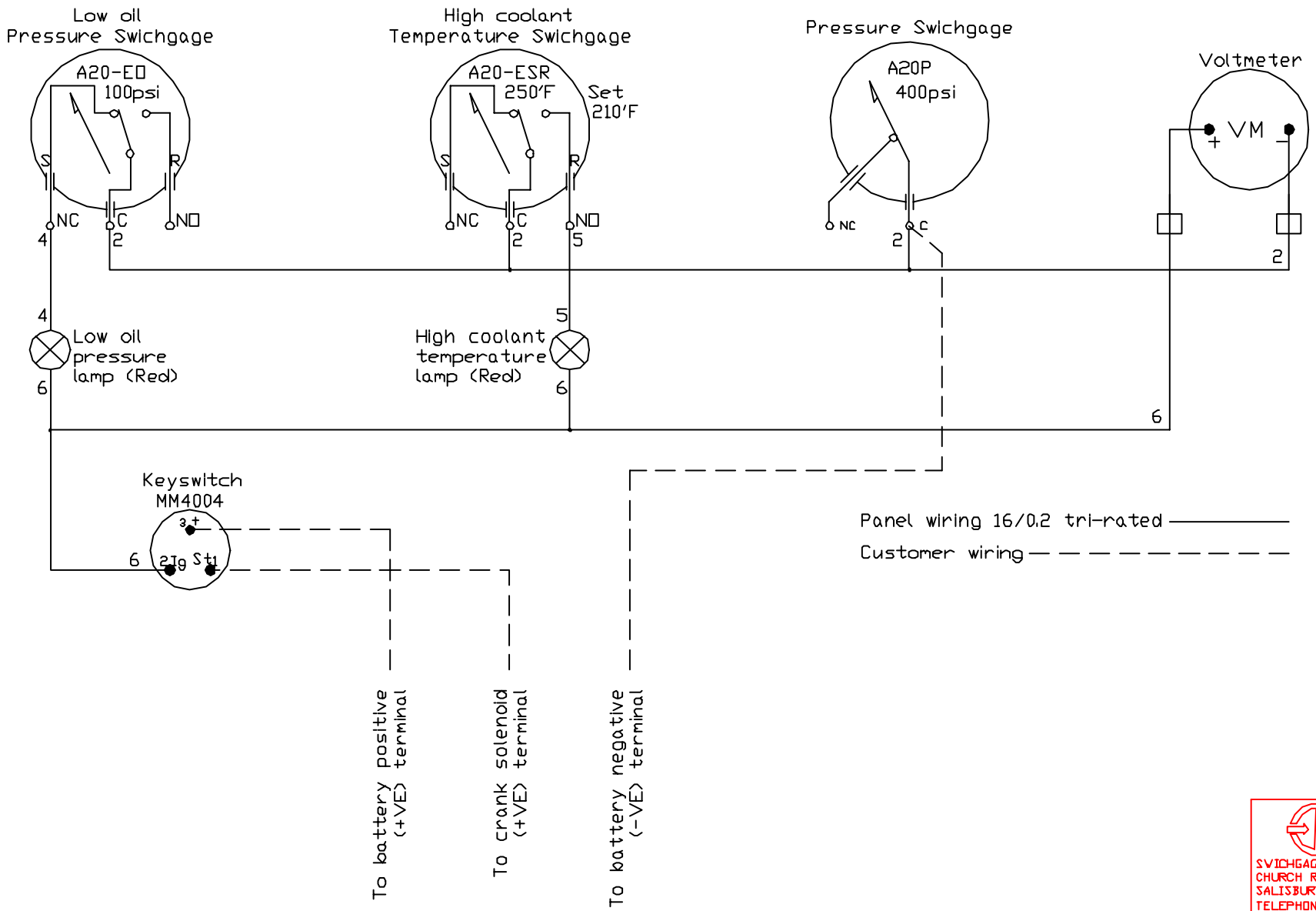
A gearbox oil pressure Swichgage A20P K 400PSI is installed in the front panel for indication only.

A voltmeter is installed to monitor the battery voltage.

The controller features a sheet steel enclosure, with all textual labels and identification shown in English, finished in black. Anti-vibration mountings are provided for mounting on a bulkhead, or on a suitable engine skid framework and should be used where appropriate to avoid subjecting the controller to engine vibration.

External connections are made through a gland in the base of the controller to a clearly labelled terminal strip inside.

IF IN DOUBT ASK



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REV	REVISION DETAILS	DATE	NAME
C	Changes As Amni 1528	17/5/96	PG
B	Wire Nos Added, Redrawn	14/6/1991	PS
A	System Insulated, A Gages	19/1/1997	GR

Customer

Murphy works order number

MAT. n/a
FINISH n/a
SCALE n/a
DRAWN P. GILBEY
DATE 31/7/97

FRANK W Murphy LTD
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SALISBURY, ENGLAND SP1 1QZ
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TITLE
Diagnostic Centre
Wiring Diagram

DRAWING No
5E3082

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Panel specification

Title EEC 200 Series Controller
Drawing No. SS4688
Date 24.11.98
Drawn By CEA

Rev	Revision Details	Date	Initials

This EEC Series Controller is for automatic control and protection of an engine. It is designed to operate with an engine fitted with a 12 Volt battery starting system and an energise to run fuel control system.

Starting may be initiated by means of a Hand-Off-Auto selector switch, as follows :-

Hand Move the selector to Hand and the engine will start and run.

Off Move the selector to Off and engine will shut down.

Auto Move the selector to Auto, and two remote, normally open contacts are monitored. Closure of the float switch (high contact) will initiate an automatic start. The engine will automatically stop and return to standby when the second float switch (low contact) opens.

The starting sequence will be as follows :-

a) Pre-heat for 10 seconds.
b) 3 crank attempts (adjustable), each of 10 seconds, separated by 20 seconds rest. Pre-heaters are active during cranking.
c) Cranking is discontinued as soon as the engine starts.
d) The engine is monitored for the following shutdown faults :-

   i) Low oil pressure
   ii) High coolant temperature
   iii) Overspeed
   iv) Failed to start (After completing all attempts)

In the event of any of these faults, the appropriate indicator on the front panel will light, and the engine will shut down. The controller will require reset by switching to Off before normal operation can be resumed.

An hoursrun counter is installed in the front panel to record total engine running hours.

An alternator warning light is provided on the front panel for indication of battery charging alternator fault.

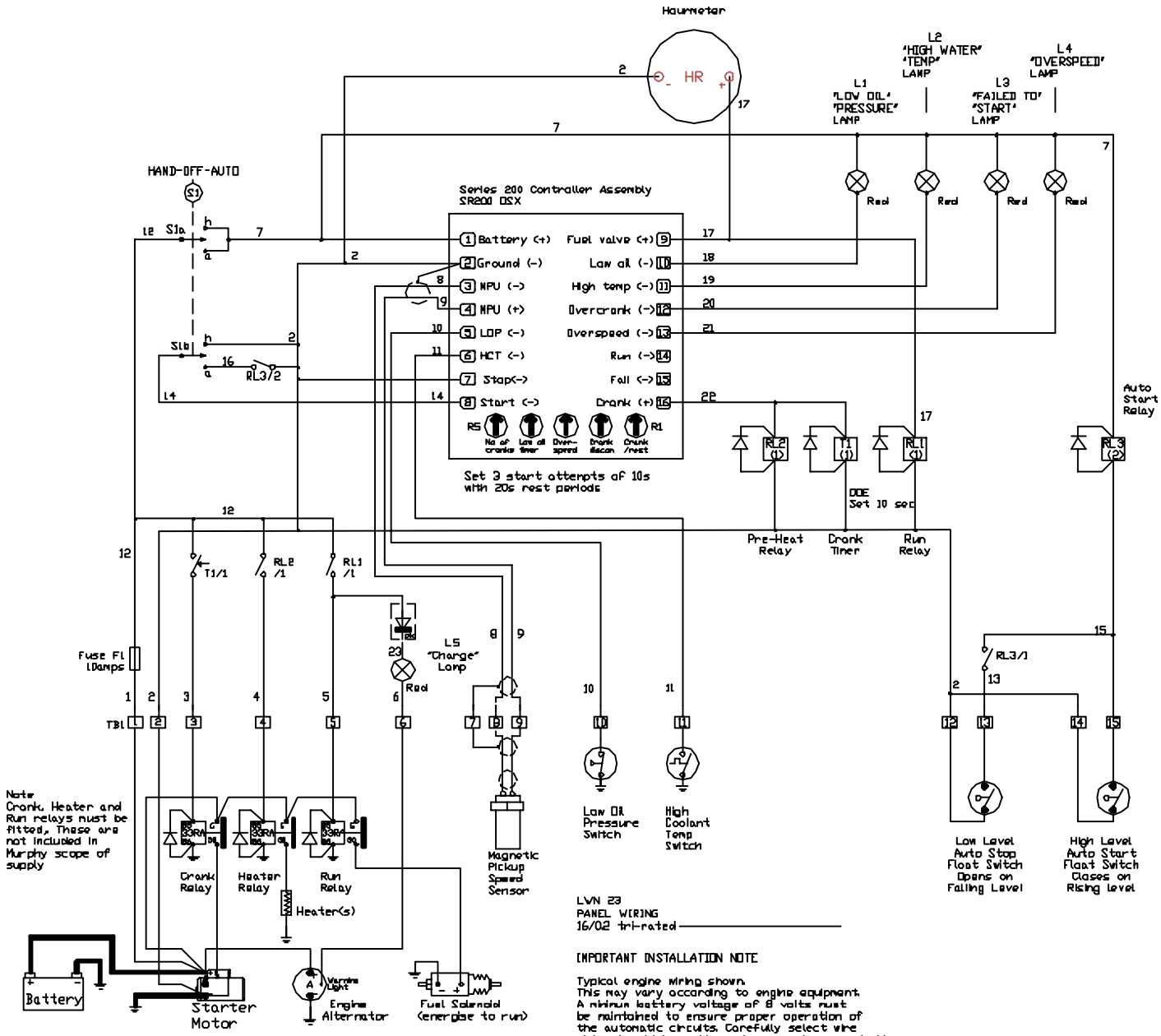
A magnetic pickup is supplied loose complete with 3 metres of shielded cable. This should be installed into the engine fly-wheel housing, and provides engine speed information to the controller.

Output signals to the starter motor, preheater and fuel control solenoids have a maximum rating of 5 Amps. Please ensure the use of solenoid relays (customer supply) for installation onto the engine.

The controller features a sheet steel enclosure, protected to IP55 and finished in beige. Lugs are provided for mounting on a bulkhead, or on a suitable engine skid framework. Anti-vibration mountings should be used where appropriate to avoid subjecting the controller to engine vibration.

External connections are made through a gland in the base of the controller to a clearly labelled terminal strip inside.

IF IN DOUBT ASK



Note
Crank, Heater and Run relays must be fitted, These are not included in Murphy scope of supply

LVN 23
PANEL WIRING
16/02 tri-rated

IMPORTANT INSTALLATION NOTE

Typical engine wiring shown. This may vary according to engine equipment. A minimum battery voltage of 8 volts must be maintained to ensure proper operation of the automatic circuits. Carefully select wire sizing to minimise voltage drops, and ensure battery is conservatively rated for installation.

System Voltage 12 VDC

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TELEPHONE 0722 410055
FAX 0722 410088
TELEX 477088

REV	REVISION DETAILS	DATE	NAME	CHECK

Customer
Murphy works order number

DRAWN G. REES
CHECKED
DATE 24/11/98

TITLE
EEC200 Series Controller 12v

DRAWING No
SE4686

Frank W. Murphy Ltd.
Swichgage House – Church Road – Laverstock
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email: sales@fwmurphy.co.uk – web: www.fwmurphy.co.uk

Panel Specification

Title	EEC 200 CONTROLLER
Drawing No.	SS5129
Date	27/4/99
Drawn By	MP
Authorised	

Rev	Revision Details	Date	Initials

This EEC Series Controller is for automatic control and protection of an engine. It is designed to operate with an engine fitted with a 12 Volt battery starting system and an energise to run fuel control system.

Starting may be initiated by means of a Hand-Off-Auto selector switch, as follows :-

Hand Move the selector to Hand and the engine will start and run.

Off Move the selector to Off and engine will shut down.

Auto Move the selector to Auto, and two remote, normally open contacts are monitored. Closure of the float switch (high contact) will initiate an automatic start. The engine will automatically stop and return to standby when the second float switch (low contact) opens.

The starting sequence will be as follows :-

a) 3 crank attempts (adjustable), each of 10 seconds, separated by 10 seconds rest (adjustable).
b) Cranking is discontinued as soon as the engine starts.
c) The engine is monitored for the following shutdown faults :-

   i) Low oil pressure
   ii) High coolant temperature
   iii) Overspeed
   iv) Failed to start (After completing all attempts)

In the event of any of these faults, the appropriate indicator on the front panel will light, and the engine will shut down. The controller will require reset by switching to Off before normal operation can be resumed.

A digital tachoursrun counter MTH6 is installed in the front panel to indicate engine RPM and to record total engine running hours.

A fully automatic battery charger, 5 Amps maximum, operating from a 240/220 VAC supply is installed complete with a door interlocked isolator and a charge ammeter.

An alternator warning light is provided on the front panel for indication of battery charging alternator fault.

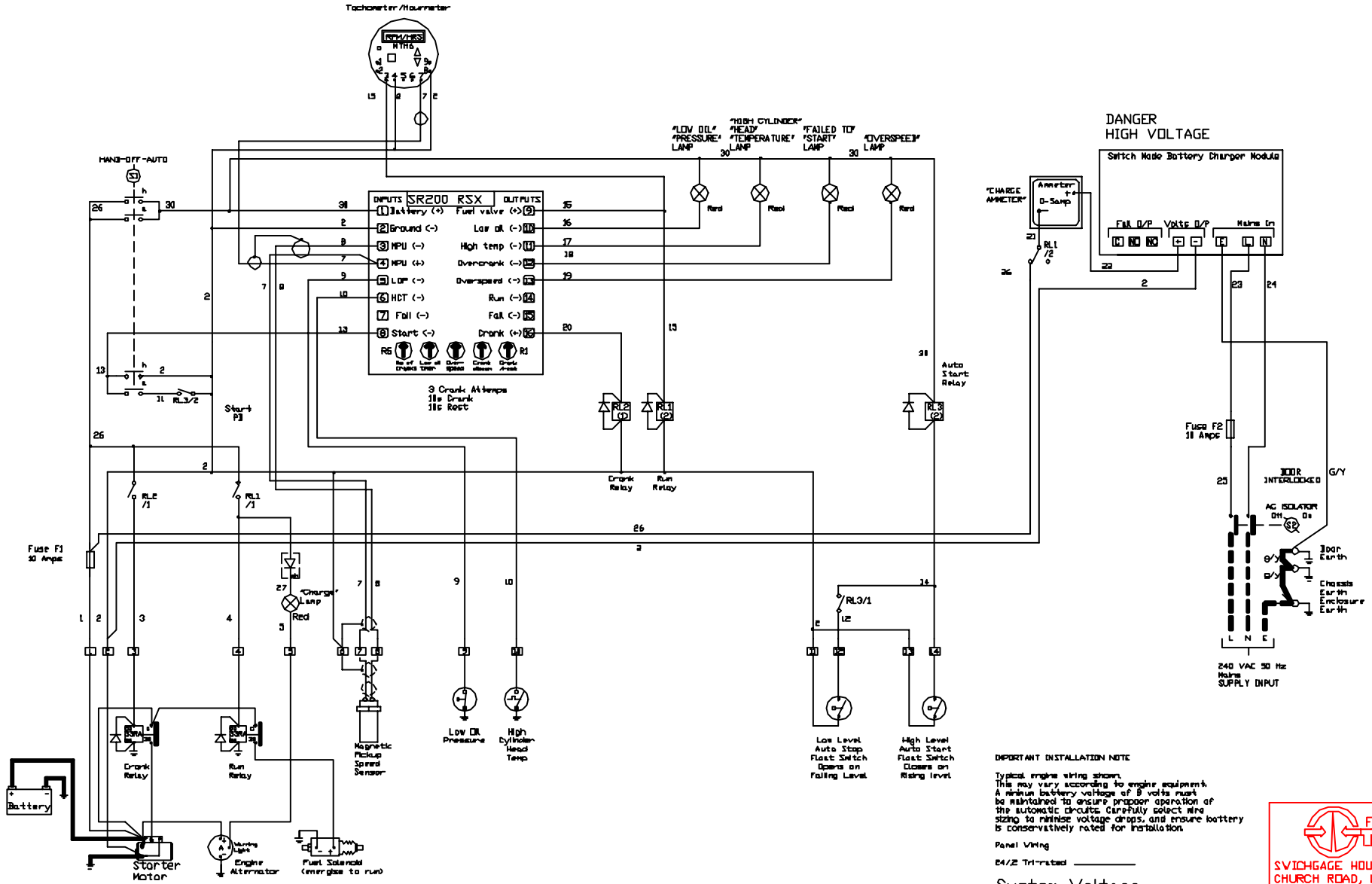
A magnetic pickup is supplied loose complete with 3 metres of shielded cable. This should be installed into the engine fly-wheel housing, and provides engine speed information to the controller.

Output signals to the starter motor and fuel control solenoids have a maximum rating of 5 Amps. We shall supply loose solenoid relays for installation onto the engine.

The controller features a sheet steel enclosure, protected to IP55 and finished in beige. Lugs are provided for mounting on a bulkhead, or on a suitable engine skid framework. Anti-vibration mountings should be used where appropriate to avoid subjecting the controller to engine vibration.

External connections are made through a gland in the base of the controller to a clearly labelled terminal strip inside.

IF IN DOUBT ASK



REV	REVISION DETAILS	DATE	NAME

Authorised

Customer

Murphy works order number

MAT. n/a
FINISH n/a
SCALE n/a
DRAWN AS
DATE 23-04-99

FRANK W Murphy LTD
SWITCHGAGE HOUSE
CHURCH ROAD, LAVERSTOCK
SALISBURY, ENGLAND SP1 1QZ
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TELEX 477088

TITLE
EEC200 Series Wiring Diagram

DRAWING No
SE5124

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email: sales@fwmurphy.co.uk – web: www.fwmurphy.co.uk

Panel specification

Title	DIAGNOSTIC CENTRE
Drawing No.	ZS5936
Date	22/05/00
Drawn By	DPE

Rev	Revision Details	Date	Initials
A	Made Universal Doc for 12 & 24v models	11/9/02	GR

The Diagnostic Centre is for control and protection of an engine. It is designed to operate with an engine fitted with a battery starting system and an energise to run fuel control system.

Starting may be initiated by means of an Off-On-Heat-Heat Start keyswitch, as follows :-

Off Move the keyswitch to Off and the engine will shutdown.

On Move the keyswitch to the On position and the fuel solenoid output is energised.

Heat Move the keyswitch to the Heat position and the pre-heater solenoid output is energised.

Heat Start Move the keyswitch to the Heat Start position and the pre-heater solenoid and starter motor solenoid outputs are energised.

The starting sequence will be as follows :-

a) Cranking should be discontinued as soon as the engine starts.
b) The engine is monitored for the following shutdown faults :-

i) Low oil pressure
ii) High coolant temperature

In the event of any of the above faults, the tattletale on the front panel will actuate and the engine will shutdown. The tattletale will require resetting before normal operation can be resumed.

An oil pressure Swichgage 20P 100 PSI-B is installed in the front panel for indication and shutdown. A suitable 1.0 metre premium quality oil line will also be supplied loose.

A coolant temperature Swichgage 20T 120C-B is installed in the front panel for indication and shutdown. This will be complete with 2.0 metres of capillary.

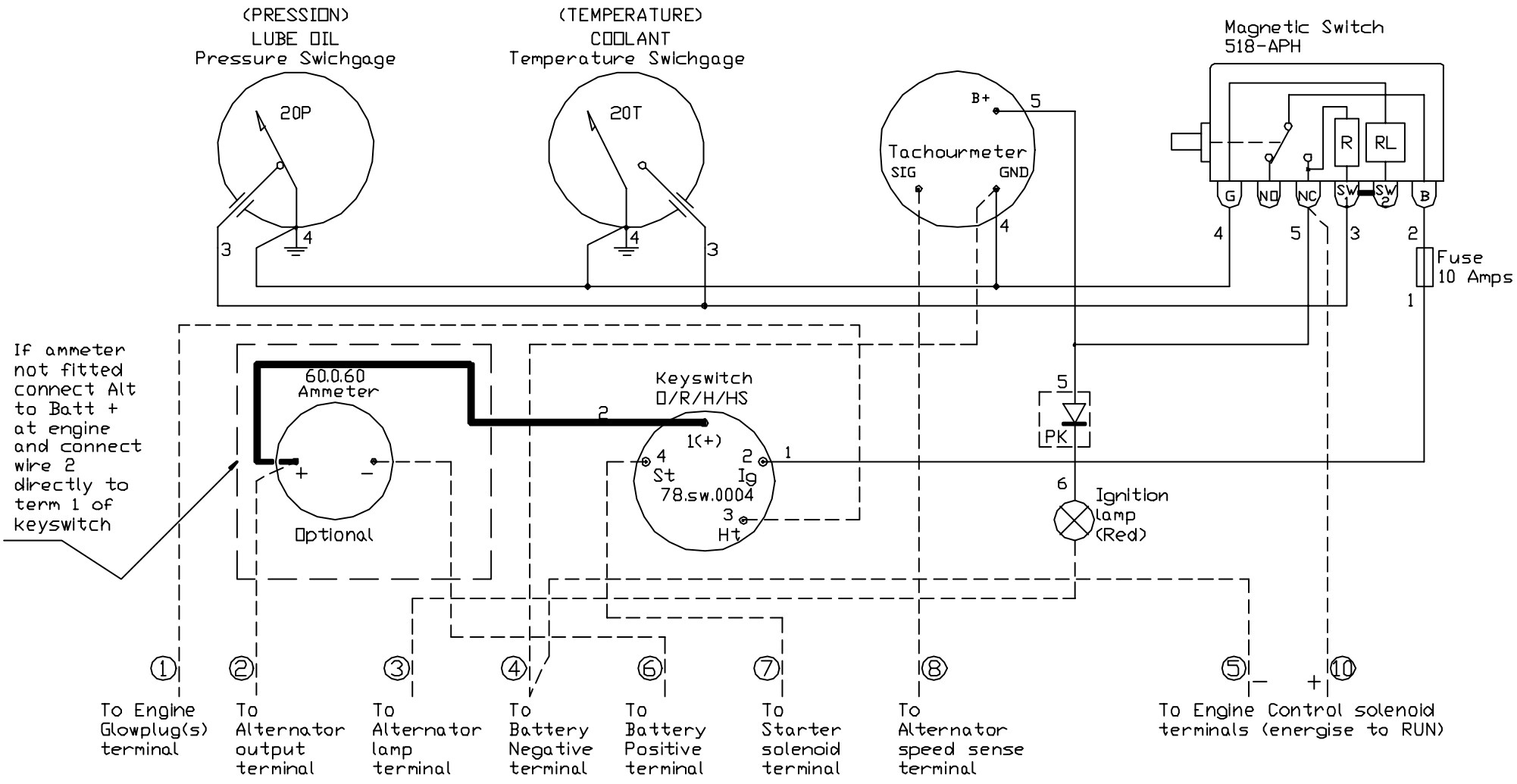
A tachoursrun counter ATHA-30-12-C is installed in the front panel to indicate engine RPM and to record total engine running hours.

An alternator warning light is provided on the front panel for indication of battery charging alternator fault.

The controller features a sheet steel enclosure, with all textual labels and identification shown in English, finished in black. Anti-vibration mountings are provided for mounting on a bulkhead, or on a suitable engine skid framework and should be used where appropriate to avoid subjecting the controller to engine vibration.

External connections are made through a gland in the base of the controller to a clearly labelled wiring harness.

IF IN DOUBT ASK



Harness wiring – – – – – – – – – – – –
Panel wiring (16/0.2 tri-rated) ————
56/0.3 tri rated ————

LWN : 6
For harness details refer to 5H2859

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REV	REVISION DETAILS	DATE	NAME
A	12v ref removed- universal	11/9/02	GR

Customer
Murphy works order number N/A

MAT.	N/A
FINISH	N/A
SCALE	N/A
DRAWN	DPE
DATE	22/05/00

TITLE
DIAGNOSTIC CENTRE

DRAWING No
ZE5940

Frank W. Murphy Ltd.
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ss6356
14th April 2003
catalog section 30

Panel Specification

Stock code: **B6085**
Panel type: **Diagnostic Centre, 12V**
Circuit reference: **1E6087**

The Diagnostic Centre is for control and protection of an engine. It is designed to operate with an engine fitted with a 12 Volt battery starting system and an energise-to-run fuel control system.

Starting may be initiated by means of an Off-On-Heat-Heat Start keyswitch, as follows :-

Off Move the keyswitch to Off and the engine will shutdown.
On Move the keyswitch to the On position and the fuel solenoid output is energised.
Heat Move the keyswitch to the Heat position and the pre-heater solenoid output is energised.
Heat Start Move the keyswitch to the Heat Start position and the pre-heater solenoid and starter motor solenoid outputs are energised.

The starting sequence will be as follows :-

a) Cranking should be discontinued as soon as the engine starts.
b) The engine is monitored for the following shutdown faults:-
   i) Low oil pressure ①
   ii) High coolant temperature ①

① **Customer supplied fault switches, normally open, closing to negative on fault.**

In the event of any of the above faults, the tattletale on the front panel will actuate and the engine will shutdown. The tattletale will require resetting before normal operation can be resumed.

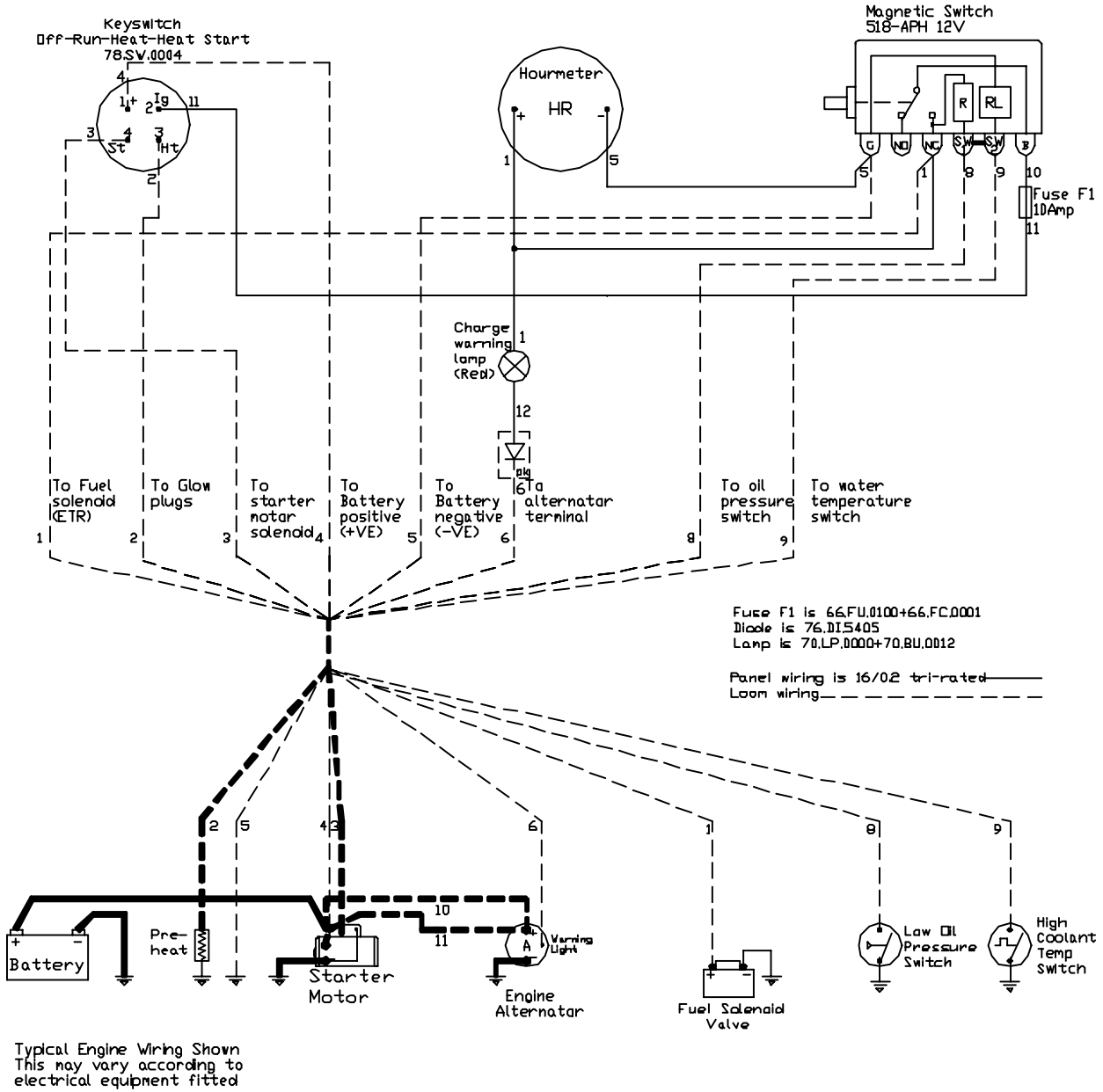
An alternator warning light is provided on the front panel for indication of battery charging alternator fault.

An hoursrun counter 00.00.0865 is installed in the front panel to record total engine running hours.

The controller features a sheet steel enclosure, with all textual labels and identification shown in English, finished in black. Anti-vibration mountings are provided for mounting on a bulkhead, or on a suitable engine skid framework and should be used where appropriate to avoid subjecting the controller to engine vibration.

External connections are made through a gland in the base of the controller to a clearly labelled terminal strip inside.

IF IN DOUBT ASK



Typical Engine Wiring Shown
This may vary according to electrical equipment fitted

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TELEX 477088

REV	REVISION DETAILS	DATE	NAME

Customer
Murphy works order number

MAT. n/a
FINISH n/a
SCALE n/a
DRAWN ML
DATE 18/08/00

TITLE
Diagnostic Centre Wiring Diagram

DRAWING No
1E6087

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Panel specification

Title	Diagnostic Centre 12V
Drawing No.	3S5985
Date	22/06/00
Drawn By	DPE

Rev	Revision Details	Date	Initials

The Diagnostic Centre is for control and protection of an engine. It is designed to operate with an engine fitted with a 12 Volt battery starting system and an energise to run fuel control system.

Starting may be initiated by means of an Off-On-Heat-Heat Start keyswitch, as follows :-

Off Move the keyswitch to Off and the engine will shutdown.

On Move the keyswitch to the On position and the fuel solenoid output is energised.

Heat Move the keyswitch to the Heat position and the pre-heater solenoid output is energised.

Heat Start Move the keyswitch to the Heat Start position and the pre-heater solenoid and starter motor solenoid outputs are energised.

The starting sequence will be as follows :-

a) Cranking should be discontinued as soon as the engine starts.
b) The engine is monitored for the following shutdown faults :-

i) Low oil pressure ①
ii) High oil temperature ①
iii) Air cleaner restriction ①

① Customer supplied switch, normally open, closing to battery negative on fault.

In the event of any of the above faults, the tattletale on the front panel will actuate and the engine will shutdown. The tattletale will require resetting before normal operation can be resumed.

A tachoursrun counter ATHA-30-12-C is installed in the front panel to indicate engine RPM and to record total engine running hours.

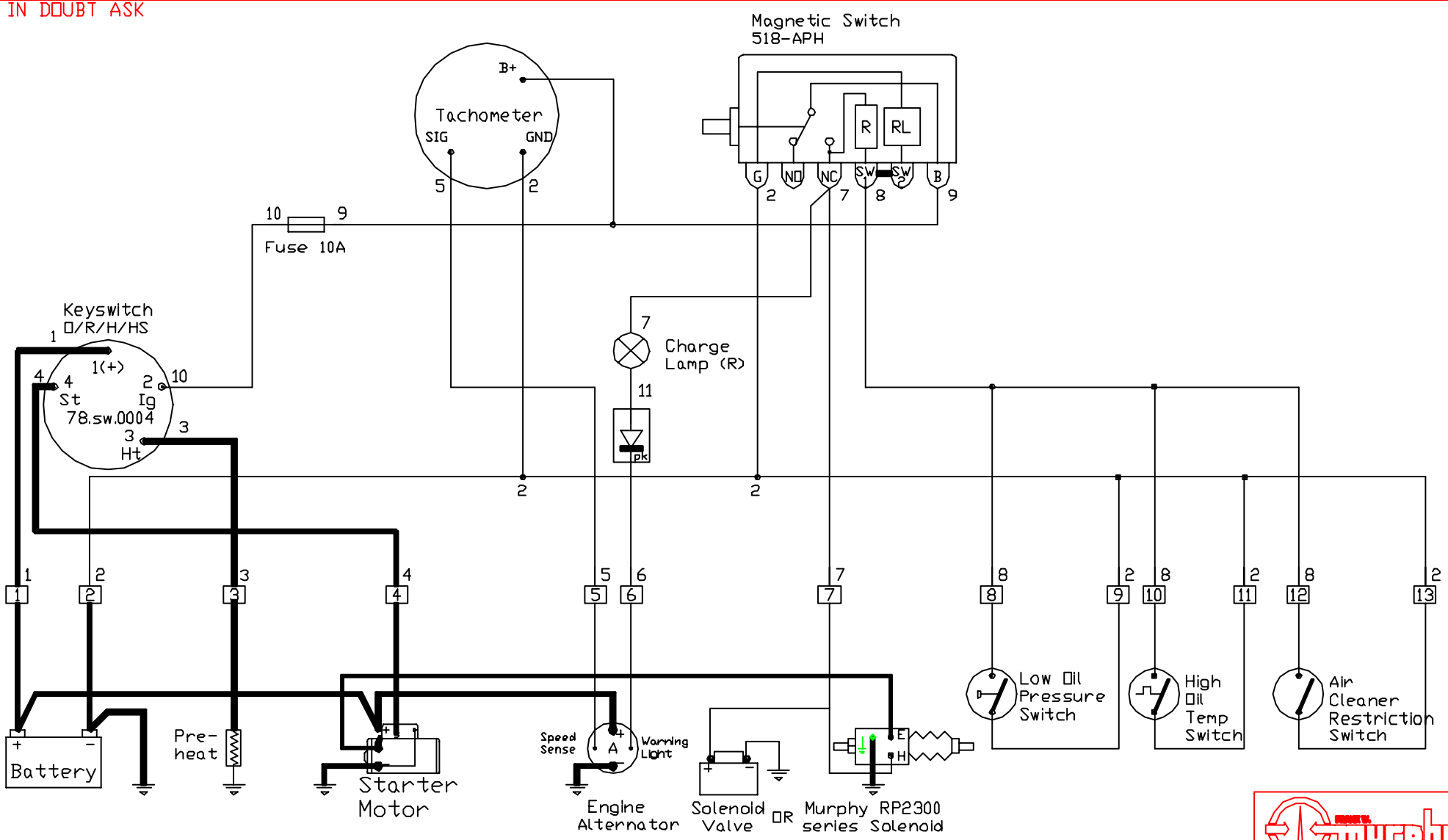
An alternator warning light is provided on the front panel for indication of battery charging alternator fault.

The controller features a sheet steel enclosure, with all textual labels and identification shown in English, finished in black. Anti-vibration mountings are provided for mounting on a bulkhead, or on a suitable engine skid framework and should be used where appropriate to avoid subjecting the controller to engine vibration.

External connections are made through a gland in the base of the controller to a clearly labelled wiring harness.

External connections are made through a gland in the base of the controller to a clearly labelled terminal strip inside. A 3.0m wiring harness, first 1.0m sheathed is supplied loose.

IF IN DOUBT ASK



Typical Engine Wiring Shown
This may vary according to
electrical equipment fitted

PANEL WIRING
50/0.25 Tri-rated
16/0.2 tri-rated

Last Wire Number 11

REV	REVISION DETAILS	DATE	NAME

MAT.	N/A
FINISH	N/A
SCALE	NTS
DRAWN	DPE
DATE	22/06/00

Tolerancing
Linear Dimensions
Nominal dimensions in mm

0.5 to 6	6 to 30	30 to 120	120 to 315	315 to 1000	1000 to 2000	2000 to 4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2

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e-mail sales@fwmurphy.co.uk
Visit Our Web Site At -
www.fwmurphy.co.uk

TITLE
Diagnostic
Centre 12V

DRAWING No
3E5987

55

Frank W. Murphy Ltd.

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Title	EEC Series 200 Controller 24V
Drawing No.	SS4734
Date	8-12-98
Drawn By	ACES
Authorised	

Rev	Revision Details	Date	Initials

This EEC Series Controller is for automatic control and protection of an engine. It is designed to operate with an engine fitted with a 24 Volt battery starting system and an energise to run fuel control system.

Starting may be initiated by means of a Hand-Off-Auto selector switch, as follows :-

Hand Move the selector to Hand and the engine will start and run.

Off Move the selector to Off and engine will shut down.

Auto Move the selector to Auto, and two remote, normally open contacts are monitored. Closure of the float switch (high contact) will initiate an automatic start. The engine will automatically stop and return to standby when the second float switch (low contact) opens.

The starting sequence will be as follows :-

a) Pre-heat for 10 seconds.
b) 3 crank attempts (adjustable), each of 10 seconds, separated by 20 seconds rest. Pre-heaters are active during cranking.
c) Cranking is discontinued as soon as the engine starts.
d) The engine is monitored for the following shutdown faults :-

   i) Low oil pressure ①
   ii) High coolant temperature ①
   iii) Overspeed
   iv) Failed to start (After completing all attempts)

① Customer supplied switch, normally open, closing to battery negative on fault.

In the event of any of these faults, the appropriate indicator on the front panel will light, and the engine will shut down. The controller will require reset by switching to Off before normal operation can be resumed.

A tachoursrun counter ATHS-30-12-C is installed in the front panel to indicate engine RPM and to record total engine running hours.

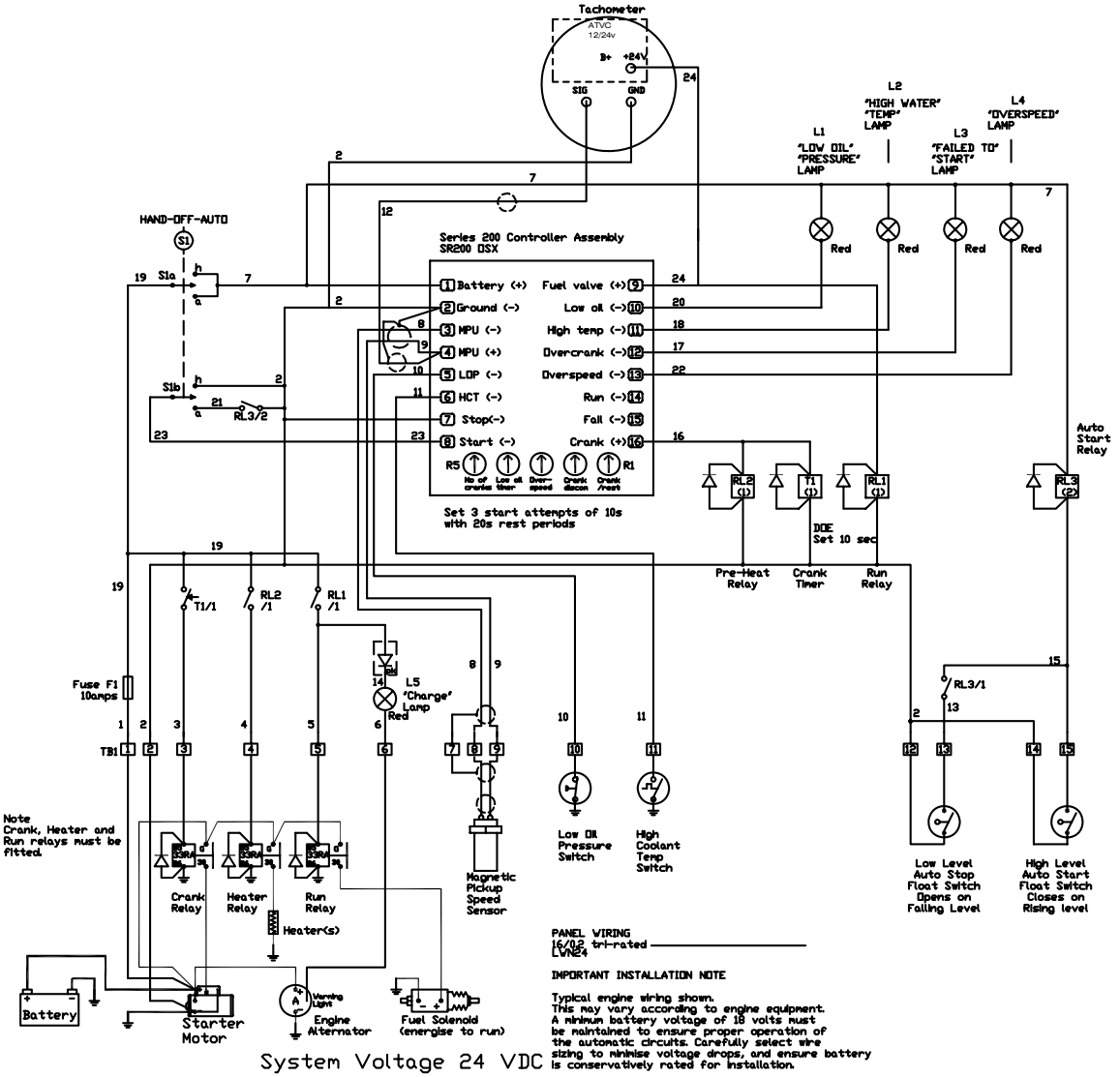
An alternator warning light is provided on the front panel for indication of battery charging alternator fault.

A magnetic pickup is supplied loose complete with 3 metres of shielded cable. This should be installed into the engine fly-wheel housing, and provides engine speed information to the controller.

Output signals to the starter motor, preheat and fuel control solenoids have a maximum rating of 5 Amps. We shall supply loose solenoid relays for installation onto the engine.

The controller features a sheet steel enclosure, protected to IP55 and finished in beige. Lugs are provided for mounting on a bulkhead, or on a suitable engine skid framework. Anti-vibration mountings should be used where appropriate to avoid subjecting the controller to engine vibration.

External connections are made to a clearly labelled terminal strip inside.



System Voltage 24 VDC

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TELEPHONE 0722 410055
FAX 0722 410088
TELEX 477088

REV	REVISION DETAILS	DATE	NAME	CHECK

Customer	DRAWN ACES
Murphy works order number	CHECKED
	DATE 08-12-98

TITLE
EEC200 Series Controller

DRAWING No
SE4733

Frank W. Murphy Ltd.
Swichgage House – Church Road – Laverstock
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ss6357
14th April 2003
catalog section 30

Panel Specification

Stock code: **B6413**
Panel type: **Diagnostic Centre, 24V**
Circuit reference: **ZE5940**

The Diagnostic Centre is for control and protection of an engine. It is designed to operate with an engine fitted with a battery starting system and an energise to run fuel control system.

Starting may be initiated by means of an Off-On-Heat-Heat Start keyswitch, as follows :-

Off Move the keyswitch to Off and the engine will shutdown.
On Move the keyswitch to the On position and the fuel solenoid output is energised.
Heat Move the keyswitch to the Heat position and the pre-heater solenoid output is energised.
Heat Start Move the keyswitch to the Heat Start position and the pre-heater solenoid and starter motor solenoid outputs are energised.

The starting sequence will be as follows :-

a) Cranking should be discontinued as soon as the engine starts.
b) The engine is monitored for the following shutdown faults :-

i) Low oil pressure
ii) High coolant temperature

In the event of any of the above faults, the tattletale on the front panel will actuate and the engine will shutdown. The tattletale will require resetting before normal operation can be resumed.

An oil pressure Swichgage 20P 100 PSI-B is installed in the front panel for indication and shutdown. A suitable 1.0 metre premium quality oil line will also be supplied loose.

A coolant temperature Swichgage 20T 120C-B is installed in the front panel for indication and shutdown. This will be complete with 2.0 metres of capillary.

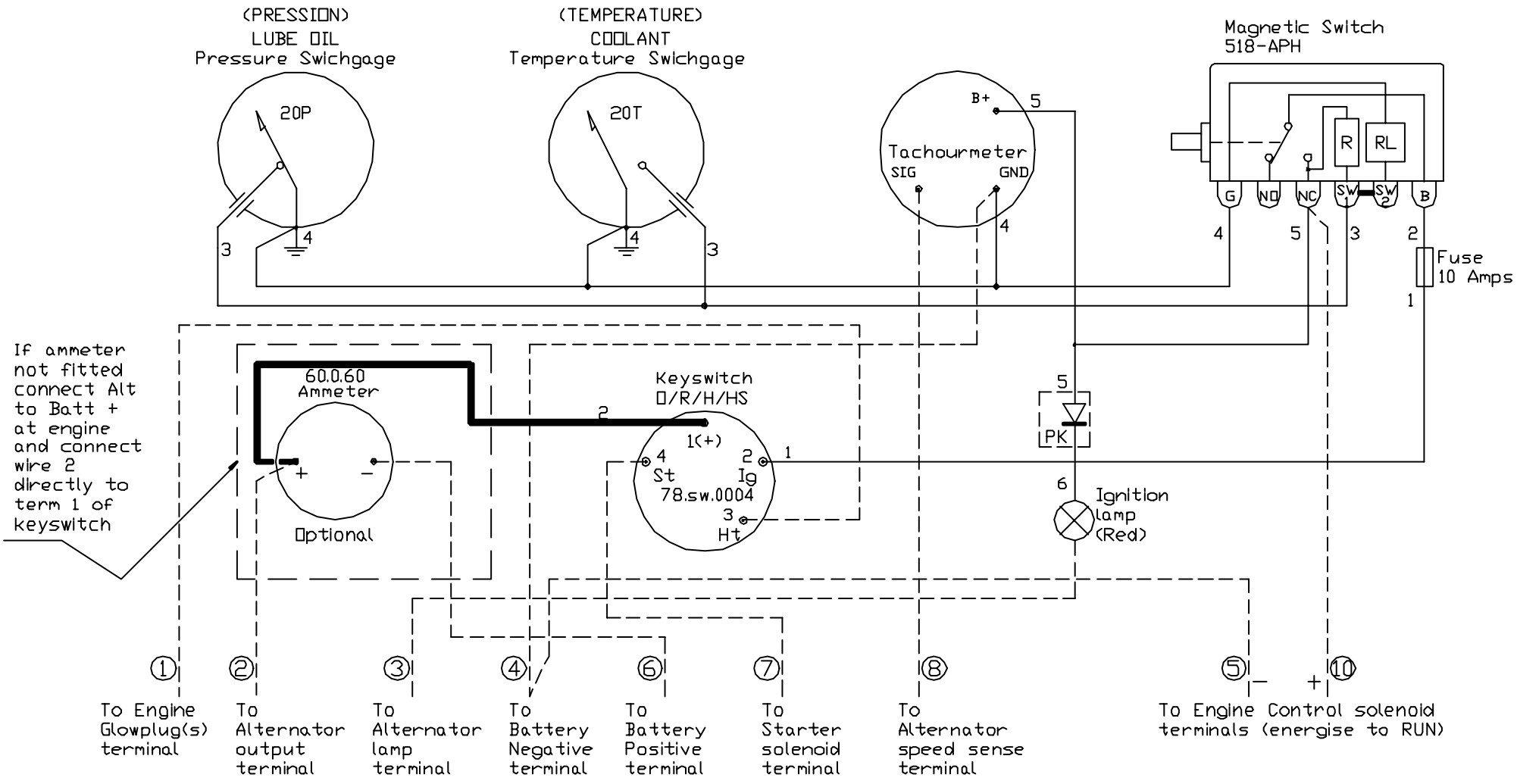
A tachoursrun counter ATHA-30-12-C is installed in the front panel to indicate engine RPM and to record total engine running hours.

An alternator warning light is provided on the front panel for indication of battery charging alternator fault.

The controller features a sheet steel enclosure, with all textual labels and identification shown in English, finished in black. Anti-vibration mountings are provided for mounting on a bulkhead, or on a suitable engine skid framework and should be used where appropriate to avoid subjecting the controller to engine vibration.

External connections are made through a gland in the base of the controller to a clearly labelled wiring harness.

IF IN DOUBT ASK



Harness wiring - - - - - - - - - - - - -
Panel wiring (16/0.2 tri-rated) ———
56/0.3 tri rated ———

LWN : 6
For harness details refer to 5H2859

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TELEX 477088

REV	REVISION DETAILS	DATE	NAME
A	12v ref removed- universal	11/9/02	GR

Customer
Murphy works order number N/A

MAT.	N/A
FINISH	N/A
SCALE	N/A
DRAWN	DPE
DATE	22/05/00

TITLE
DIAGNOSTIC CENTRE

DRAWING No
ZE5940

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