



Technical Information

PLUS+1[®] Mobile Machine Displays DP570 Series



Revision History*Table of Revisions*

Date	Page	Changed	Rev
05 Dec 2013	6	Model feature	DA
23 Nov 2013	17-18	Screw lengths and torque	CA
18 Nov 2013	14	Operating temperature	BA
05 Nov 2013			AA

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Reference Documents**Literature Types****Technical Information (TI)**

A TI is comprehensive information for engineering and service personnel to reference.

Data Sheet (DS)

A DS is summarized information and parameters that are unique to a specific model.

API Specifications (API)

An API is specifications for programming variable settings.

API specifications are the definitive source of information regarding pin characteristics.

PLUS+1® GUIDE Software User Manual

This user operation manual (OP) details information regarding the PLUS+1 GUIDE software tool set that is used to build PLUS+1 applications.

DP570 Series PLUS+1 Mobile Machine Displays Reference Documents

Literature title	Literature type	Literature number
DP570 Series PLUS+1 Mobile Machine Displays	Technical Information	L1328765
DP570 Series PLUS+1 Mobile Machine Displays	Data Sheet	L1317788
PLUS+1 GUIDE Software User Manual	Operation Manual	10100824

Technical Literature is on line at: www.danfoss.com

Product Overview

DP570 Series PLUS+1 Mobile Machine Displays

The DP570 is designed to perform in the most extreme mobile machine environments.

The latest technology with backlight provides outstanding brightness and contrast performance resulting in an easy-to-read screen.

Develop your own software and layout with PLUS+1 GUIDE and the screen editor. A graphic library is available for fast time-to-market.

User Liability and Safety Statements

OEM Responsibility

The OEM of a machine or vehicle in which a Danfoss product is installed has the full responsibility for all consequences that might occur. Danfoss has no responsibility for any consequences, direct or indirect, caused by failures or malfunctions.

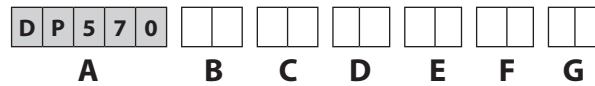
- Danfoss has no responsibility for any accidents caused by incorrectly mounted or maintained equipment.
- Danfoss does not assume any responsibility for Danfoss products being incorrectly applied or the system being programmed in a manner that jeopardizes safety.
- All safety critical systems shall include an emergency stop to switch off the main supply voltage for the outputs of the electronic control system. All safety critical components shall be installed in such a way that the main supply voltage can be switched off at any time. The emergency stop must be easily accessible to the operator.

Ordering Information

Model Features

Use the following table to identify model features.

This is not a variant configurator.



A	B	C	D	E	F	G	Part number
DP570	01	00	00	00	00	01	11134525
DP570	01	00	00	00	01	01	11130432
DP570	01	00	00	00	00	00	11140997
DP570	01	00	00	00	01	00	11140996

- A** *Model Name*

DP570	PLUS+1 Mobile Machine Displays
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- B** *Input/Output Options*

01	User configurable: 1 CAN, 2 DIN/AIN, 2 DIN/AIN/4-20 mA, 2 Multi-function, 1 DOUT or 2 CAN, 2 DIN/AIN/4-20 mA, 2 Multi-function, 1 DOUT
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- C** *Real Time Clock*

00	RTC
-----------	-----
- D** *Flash Memory/Application key*

00	512 MB/without application key
-----------	--------------------------------
- E** *Application log (Vault Memory)*

00	16 MB
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- F** *Video Input options*

00	None
01	One Video Input
- G** *Mounting options*

00	Post mount cover
01	Panel mounting

Ordering Information

Related Products

Danfoss Assembled Mating Connector Kits

DP570 mating connector kit and contents	Part numbers
Connectors	
M12 5-pin male	11130712
Terminal	
Deutsch	10100743
Crimp tool	
16 to 20 AWG	10100744
20 to 24 AWG	10100745
Locking plug	
12-pin Deutsch WM 12S	10100741
12-pin connector kit (16 to 20 AWG)	
Deutsch DTM06-12SA 12-pin connector	10102025
12-pin connector kit (20 to 24 AWG)	
Deutsch DTM06-12SA 12-pin connector	10100944
Connection-kit DP570 with camera cable	11145163

Accessories

Description	Part number
Panel mounting kit	11140430
Compact color camera, 12 V	10100831
PLUS+1 GUIDE Software Application (includes a single user licence, Service and Diagnostic tool and a Screen Editor)	10101000
Post mount cover option	11144122

Inputs/Outputs

Inputs

DP570 Series displays support the following pin types:

- Digital, Analog
- Digital, Analog or 4–20 mA
- Multifunction (DIN/AIN/FreqIN, Rheo, 4–20 mA)

DP570 Series displays have input pins that support multiple functions. Pins that support multiple input types are user-configurable using PLUS+1 GUIDE software.

Digital/Analog/CAN

Normal Range Multifunction Input

Description	Unit	Minimum	Maximum	Comment
Range	V	0	5.88	—
Resolution	mV	2.14		—
Worst case error	mV	130		—
Input impedance	kΩ	233 ± 3		To 0 V
Input impedance with pull-down	kΩ	14.1 ± 0.2		To 0 V
Input impedance with pull-up	kΩ	14.1 ± 0.2		To 5 V
Input impedance with pull-up/down	kΩ	7.3 ± 0.1		To 2.5 V

High Range Multifunction Input

Description	Unit	Minimum	Maximum	Comment
Range	mV	0	37.296	—
Resolution	mV	14.3		—
Worst case error	V	1.296		—
Input impedance	kΩ	110 ± 2		To 0 V
Input impedance with pull-down	kΩ	13.2 ± 0.2		To 0 V
Input impedance with pull-up	kΩ	13.2 ± 0.2		To 5 V
Input impedance with pull-up/down	kΩ	7 ± 0.1		To 2.5 V

Digital/Analog/4–20 mA

Normal Range Multifunction Input

Description	Unit	Minimum	Maximum	Comment
Range	V	0	5.88	—
Resolution	mV	2.14		—
Worst case error	mV	130		Over the full temperature range -30° C to +60° C (-22° F to +140° F)
Input impedance	kΩ	233 ± 3		No pull up or pull down
Input impedance with pull-down	kΩ	14.1 ± 0.2		Pull down to ground
Input impedance with pull-up	kΩ	14.1 ± 0.2		Pull up to +5 V
Input impedance with pull-up/down	kΩ	7.3 ± 0.1		Pull up to +2.5 V

Current Input

Description	Unit	Minimum	Maximum	Comment
Range	mA	0	54.3	—
Resolution	μA	21		—
Worst case error	mA	1.7		Over the full temperature range -30° C to +60° C (-22° F to +140° F)
Input impedance	Ω	100.76 ± 0.1		—

Inputs/Outputs

Multifunction

Frequency Input Range (PPU)

Description	Values			Comment
	Minimum	Typical	Maximum	
Low Range:				
Minimum discernible voltage	0 mV	—	12.9 mV	—
Maximum discernible voltage	377 mV	404 mV	431 mV	—
Precision	—	—	0.149 mV	—
Worst case error	—	—	27 mV	Over the full temperature range -30° C to +60° C (-22° F to +140° F)
Rising Voltage Threshold	0.11 V	—	0.30 V	Voltage required for frequency input to read high
Falling Voltage Threshold	0.04 V	—	0.22 V	Voltage required for frequency input to read low
Input impedance	230 kΩ	233 kΩ	236 kΩ	No pull up or pull down
Input impedance	13.9 kΩ	14.1 kΩ	14.3 kΩ	Pull up to +5V or pull down to ground
Input impedance	7.2 kΩ	7.3 kΩ	7.4 kΩ	Pull to +2.5V
Middle Range:				
Minimum discernible voltage	0 mV	—	20 mV	—
Maximum discernible voltage	5.62 V	5.75 V	5.88 V	—
Precision	—	—	2.14 mV	—
Worst case error	—	—	130 mV	Over the full temperature range -30° C to +60° C (-22° F to +140° F)
Input impedance	230 kΩ	233 kΩ	236 kΩ	No pull up or pull down
Input impedance (5V/GND)	13.9 kΩ	14.1 kΩ	14.3 kΩ	Pull up to +5V or pull down to ground
Input impedance (2.5V)	7.2 kΩ	7.3 kΩ	7.4 kΩ	Pull to +2.5 V
Rising Voltage Threshold	1.78 V	—	3.92 V	Voltage required for frequency input to read high
Falling Voltage Threshold	0.84 V	—	2.79 V	Voltage required for frequency input to read low
High Range:				
Minimum discernible voltage	0 mV	—	130 mV	—
Maximum discernible voltage	34.704 V	36 V	37.296 V	—
Precision	—	—	14.3 mV	—
Worst case error	—	—	1.296 V	Over the full temperature range -30° C to +60° C (-22° F to +140° F)
Input impedance	108 kΩ	110 kΩ	112 kΩ	No pull up or pull down
Input impedance (5V/GND)	13.0 kΩ	13.2 kΩ	13.4 kΩ	Pull up to +5V or pull down to ground
Input impedance (2.5V)	6.9 kΩ	7 kΩ	7.1 kΩ	Pull to +2.5V
Rising Voltage Threshold	11.83 V	—	26.55 V	Voltage required for frequency input to read high
Falling Voltage Threshold	5.61 V	—	18.89 V	Voltage required for frequency input to read low.

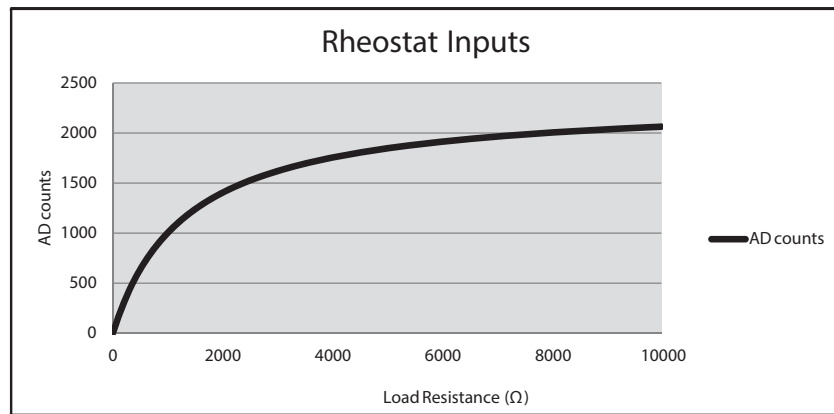
Inputs/Outputs

Multifunction (continued)

Resistance Input

Description	Unit	Minimum	Maximum	Comment
Range	Ω	0	10000	—
Resolution	—	—	—	—
Source current	mA	0	3.6*	—

*When configured as a resistance/rheostat/temp sensor input, the device will provide up to 3.76 mA current to an external load which can then be measured. The equation for calculating AD counts for a given load is: $AD\ counts = (2338 * RL / (RL + 1330))$. The following chart shows the relationship between AD counts and load:



4–20 mA Input:

Description	Unit	Minimum	Maximum	Comment
Range	mA	0	54.3	—
Resolution	μA	21		—
Worst case error	mA	1.7		Over the full temperature range -30° C to +60° C (-22° F to +140° F)
Input impedance	Ω	100.76 ± 0.1		—
Maximum over-current voltage	V	5.43		—

Inputs/Outputs

The displays do not have a Real Time Operating System (RTOS). Because of this the display should not be used as the master control for any type of safety critical control, or closed loop control system. Frequency inputs are managed by the operating system. Because of this it should be avoided to use these inputs for any type of Safety Critical closed loop control as the accuracy maybe affected by processor load. They should only be used for non-safety critical related functions.

Encoder

The encoder input is only suitable for user interface functions, such as, navigating in menus and adjusting values because there is no guarantee that all pulses are detected and the detected direction can be false. The rate of pulses should be kept at a few tens per second to minimize the loss of detected position changes.

The encoder function samples the A and B signals from the encoder and increments or decrements the counter according to the phase sequence. The counter is incremented/decremented on every low to high and high to low edge of the A signal. Some encoders with detents give a complete pulse between detents and the counter will be incremented/decremented by two for every detent. The counter is incremented when the A signal is the leading phase and decremented in the opposite case.

Video

There is one video input, which can accept either NTSC or PAL video signals.

Video Power Output

Description	Unit	Minimum	Maximum	Typical	Comment
12V	V	11.58	12.42	12	—
Video camera power current	mA	0	400	-	—
Short circuit protection	V		36		—

Controller Area Network (CAN) Specifications
CAN Shield/Analog Inputs

The CAN shield pin on the unit can be used as a non-configurable analog input.

The values in the following table assumes that software compensates for errors in the analog to digital (A/D) converter.

CAN Shield

Description	Unit	Minimum	Maximum	Typical	Comment
Input impedance	—	—	—	0.68 μ F + 1 Ω	—

CAN Communication

There are two stand-alone CAN-busses. Both CAN ports are software configurable and can be used for PLUS+1 communication. One of them can be used either as CAN or a digital-analog input.

CAN Communication

Description	Unit	Minimum	Maximum	Comment
Available baud rates	kBd	50	1000	The default baud rate is 250kbit.
Maximum input voltage range	V	0	36	—

Memory

NV Memory

! Caution

Non-volatile (NV) memory data loss is possible when the NV write cycle is not fully completed. When downloading a new application ensure data is not being written to NV memory.

FRAM Memory

DP570 displays use Ferroelectric Random Access Memory (FRAM). FRAM has a write endurance of over 100 trillion cycles, which is ideal for datalogging. 2kB is available for applications.

Vault Memory

DP570 displays have 16 MB of flash vault memory (application logging memory). Application developers use this memory to log machine event data then use the PLUS+1 Service Tool to extract the logged data.

Accessing non-volatile or application log memory can delay the service tool scan.

Real Time Clock (RTC)

Parameter	Minimum	Maximum	Unit
Backup Time	1		month
Drift		10	s/day

Product Ratings
Electrical
Supply Voltage

Description	Unit	Minimum	Maximum	Typical	Comment
DC supply voltage	V	9	36	—	With reverse polarity protection
DC supply current (circuit board only)	A	0	—	0.5	UBat = 12 V
		0	—	0.25	UBat = 24 V
Power supply interruption (without rebooting)	ms	—	—	—	200 ms

⚠ Warning

Output pins produce high voltage. High voltage can cause fire and/or electrical shock, if flammable gasses or chemicals are present, can cause an explosion. To protect against product damage and possible injury, do not exceed power supply voltage ratings and do not store this product where flammable gasses or chemicals are present.

Environmental
General

Description	Unit	Minimum	Maximum	Comment
Operating temperature	°C [°F]	-20 [-4]	+60 [+140]	—
Storage temperature	°C [°F]	-30 [-22]	+80 [+176]	—
Ingress Protection (IP) rating	IP65			With mating connector installed, and sealing plugs in unused connections.

⚠ Warning

Excessive high/low operating/storage temperatures can damage electronics. Damaged electronics can result in performance failure. To protect against product damage and possible injury, do not operate/store product in a environment that exceeds specified temperature ratings.

Product Ratings**Testing Criteria***Climatic*

Condition	Rating
Cold/heat storage and operation	IEC 60068-2-1, IEC 60068-2-2
Temperature change	IEC 60068-2-14
Moisture ingress	IEC 60529
Sunlight radiation	ISO 16750-4
Temp humidity voltage	IEC 60068-2-38

Mechanical

Condition	Rating
Vibration, resonance	IEC 60068-2-6
Vibration, operation	IEC 60068-2-64
Bump	IEC 60068-2-29
Shock	IEC 60068-2-27
Free fall	IEC 60068-2-32

Housing

Assembly

The housing comes pre-assembled.

Opening the display's housing voids the factory warranty.

Screen

! Caution

Prolonged exposure to direct intense sunlight can cause premature failure of the LCD module. This risk can be reduced by providing shading or mounting the display at an incline rather than the horizontal.

There is protective glass over the display screen.

! Caution

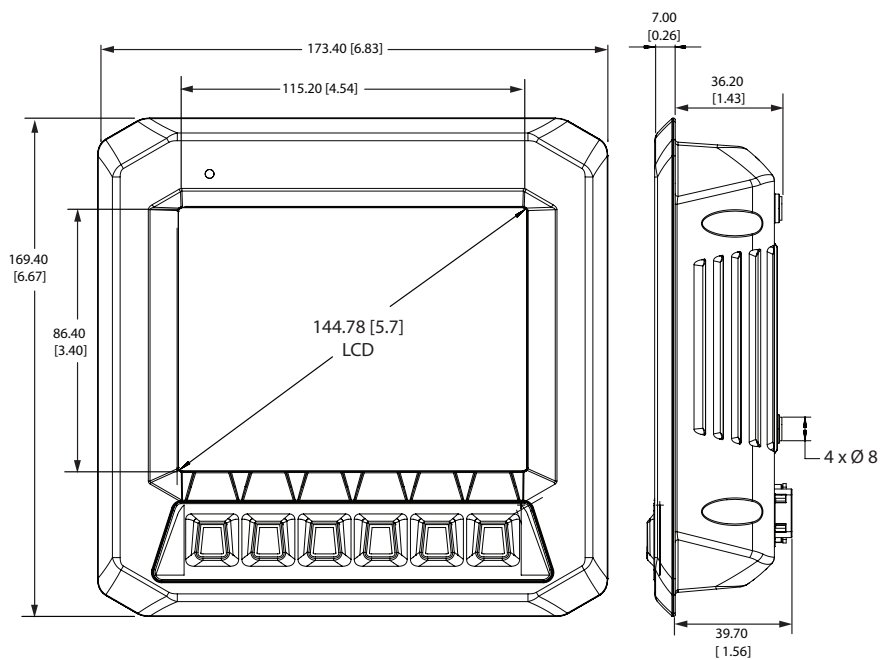
The protective glass will break if hit with a hard or heavy object. If the protective glass is broken, remove the display from your machine then return the display to Danfoss to be serviced.

Clean the display's housing and protective glass with a clean, soft, damp cloth, or mild dishwashing detergent. Use of abrasive pads and solvents, including alcohol, benzene, and paint thinner can cause scratching and discoloration.

Installation

Dimensions

DP570 in Millimeters [Inches]

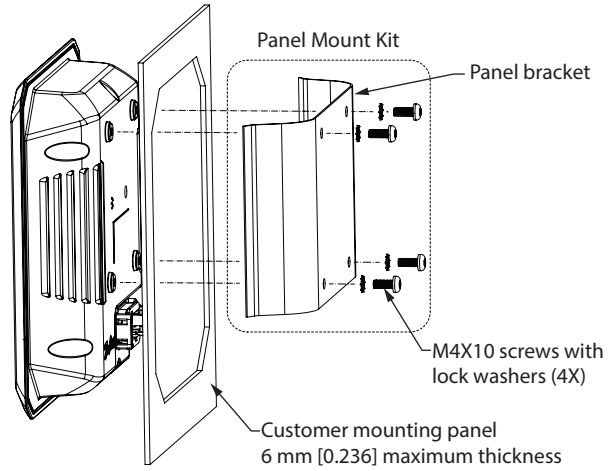
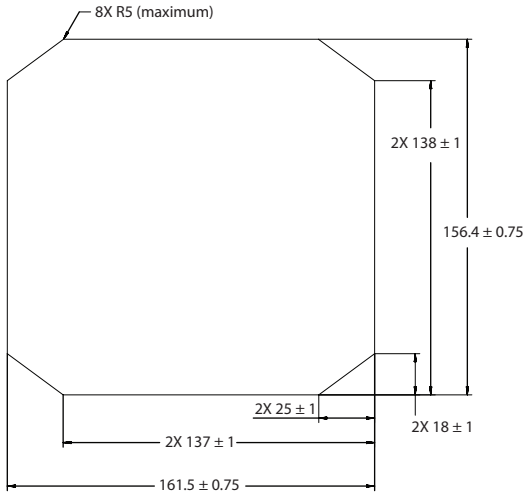


Installation

Two Mounting Options

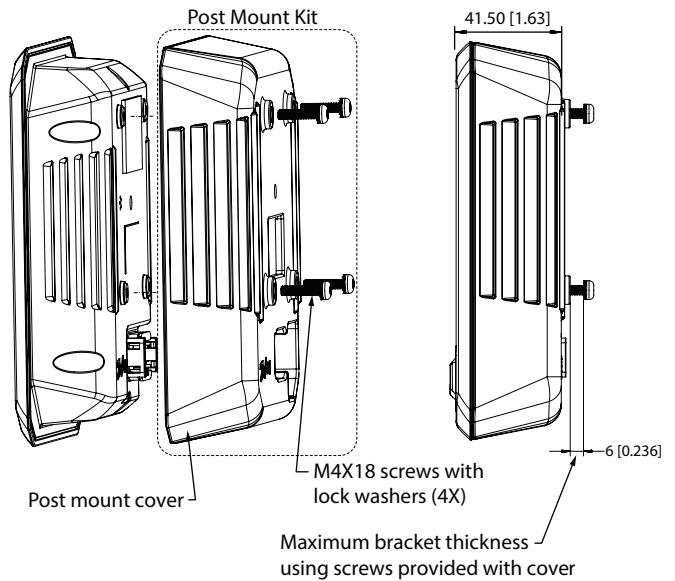
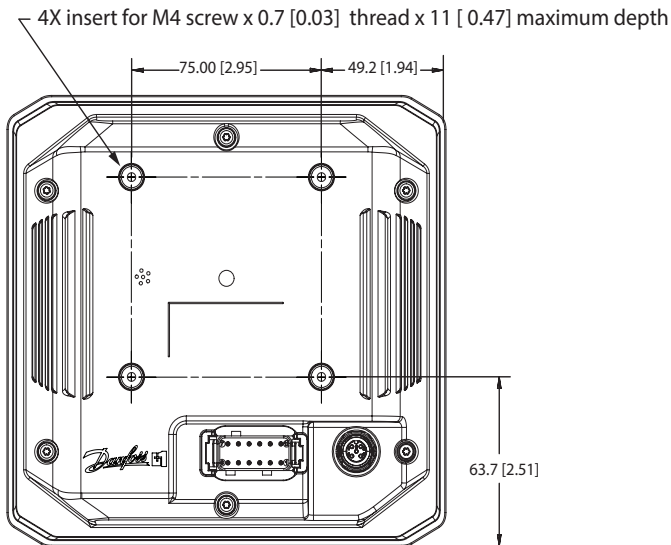
Flush Mounted

Use the Danfoss panel mounting kit (Danfoss part number 11140430) to flush-mount into a dashboard.



Stand-Alone On Post

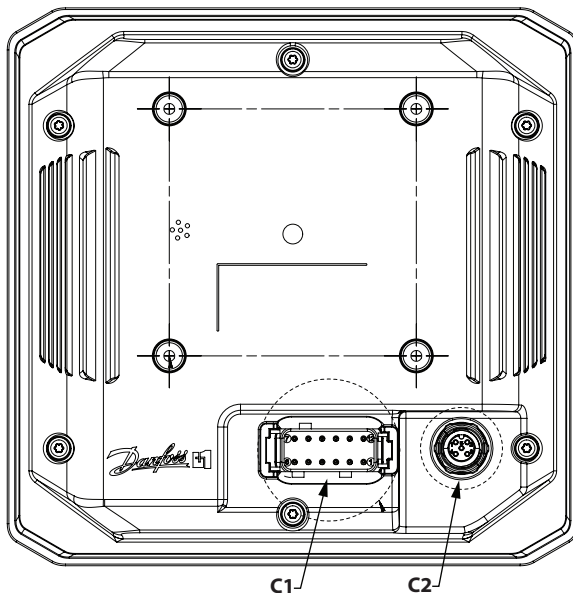
Mount according to VESA (Video Electronics Standards Association) Mount Standards The VESA hole pattern for this display is: 75.00 mm x 75.00 mm (02.95 in x 02.95 in).



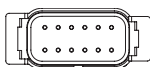
Disconnect your machine's battery power before connecting power and signal cables to the display.

Installation

Pin Assignments

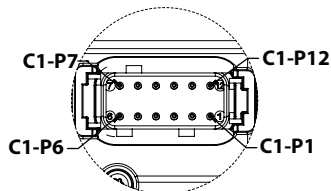


Deutsch® DTMO6 12 Pin



C1 pin	Function
C1-P1	Power Ground -
C1-P2	Power Input +
C1-P3	CAN0 High +
C1-P4	CAN0 Low -
C1-P5	CAN Shield
C1-P6	CAN1 High + or DIN/AIN
C1-P7	CAN1 Low - or DIN/AIN
C1-P8	DIN/AIN/4-20 mA
C1-P9	DIN/AIN/4-20 mA
C1-P10	Multi-function Input
C1-P11	Multi-function Input
C1-P12	DOUT

Deutsch Connector

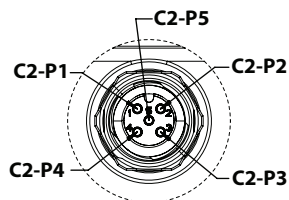


M12 5 Pin



C2 pin	Function
C2-P1	Video Power Ground
C2-P2	Video Power Supply
C2-P3	Video Signal Input 1
C2-P4	Video Signal Ground
C2-P5	NC

Phoenix Connector



Installation

The following guidelines are recommended when machine is equipped with a PLUS+1 mobile machine display.

Wiring

- Protect wires from mechanical abuse, run wires in flexible metal or plastic conduits.
- Use 85° C (185° F) wire with abrasion resistant insulation and 105° C (221° F) wire should be considered near hot surfaces.
- Use a wire size that is appropriate for the module connector.
- Separate high current wires such as solenoids, lights, alternators or fuel pumps from sensor and other noise-sensitive input wires.
- Run wires along the inside of, or close to, metal machine surfaces where possible, this simulates a shield which will minimize the effects of EMI/RFI radiation.
- Do not run wires near sharp metal corners, consider running wires through a grommet when rounding a corner.
- Do not run wires near hot machine members.
- Provide strain relief for all wires.
- Avoid running wires near moving or vibrating components.
- Avoid long, unsupported wire spans.
- Power the analog sensors by the sensor power source from the module and ground returned to the sensor ground pin on the module.
- Twist sensor lines about one turn every 10 cm (4 in).
- Use wire harness anchors that will allow wires to float with respect to the machine rather than rigid anchors.

Ground electronic modules to a dedicated conductor of sufficient size that is connected to the battery (-).

Welding** Warning**

Power and signal cables produce high voltage. High voltage can cause fire and/or electrical shock, if flammable gasses or chemicals are present, can cause an explosion. To protect against product damage and possible injury, before doing any electrical welding on a machine, disconnect all power and signal cables connected to the display.

1. Turn the engine off.
2. Disconnect the negative battery cable from the battery.
3. Do not use electrical components to ground the welder.
4. Clamp the ground cable for the welder to the component that will be welded as close as possible to the weld.

Notes

Notes

Notes



Products we offer:

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www.turollaocg.com

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Daikin-Sauer-Danfoss

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