

ENGINEERING
TOMORROW



Electrical Installation

Joysticks

JS1 Heavy Duty



Revision history

Table of revisions

Date	Changed	Rev
January 2018	Removed description for One 12 pin DEUTSCH connector topic and a row from Danfoss connector bag assemblies part numbers table; Added rows to Electrical—CAN, CAN+, and CANalog table	0301
December 2016	Added PVE information	0201
February 2016	First edition	0101

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Danfoss literature references

Technical literature

Title	Description	Literature number
<i>JS1 Heavy Duty Joysticks Technical Information</i>	Complete product electrical and mechanical specifications	BC00000347
<i>JS1 J1939 Function Block User Manual</i>	Compliant function blocks set-up information	AQ00000202
<i>JS1 CANopen Function Block User Manual</i>		AQ00000203

Comprehensive technical literature is online at powersolutions.danfoss.com

Product overview

JS1-H description

A wide variety of new grip designs



The Danfoss JS1 platform offers a wide variety of new grip designs and were developed after extensive research detailing operator needs. The JS1 heavy duty joysticks (JS1-H) and compatible grips meet the demanding conditions typically found in mobile equipment environments. The available grips features provide a high degree of protection from chemicals, shock, vibration and EMC exposure. Danfoss joysticks are appropriate for both in-cabin and out of cabin applications and feature ergonomic forms that minimize machine operator fatigue. The JS1-H ergonomic left-hand, right-hand and ambidextrous grip design options enable efficient operation and comfortable human-machine interface with easy to use fingertip controls for maximum productivity. The grips feature a modular design that allows switch and proportional rollers locations flexibility.

Electrical—PVE (Standard and Extended)

Electrical—PVE (Standard and Extended) characteristics

Supply voltages	U _{DC}		9 to 36 V _{DC}
Maximum current consumption			8 A
Current consumption, no load			150 mA
Maximum load for push buttons and directional switches for all proportional functions			0.6 A
Neutral position switch			3 A
Sensor type			Hall effect with redundant sensors
			Potentiometer
Signal voltage U _S	Minimum to maximum		0.25 to 0.75
	Neutral position		0.50
Signal load in neutral position	Load type	PVE	Other
	Load impedance	>6 kΩ	>15 kΩ
Signal current at maximum movement	U _{DC} = 12 V	6 kΩ	15 kΩ
		± 0.6 mA	0.2 to 0.6 mA
	U _{DC} = 24 V	± 1.2 mA	0.4 to 1.2 mA
Signal current in neutral position	U _{DC} = 12 V	± 0 mA	± 0.4 mA
	U _{DC} = 24 V	± 0 mA	± 0.8 mA
Inverter	Non inverted		Output signal = U _S
	Inverted		Output signal = -1 x (U _S -0.5 x U ₊) + 0.5 x U ₊

Product overview

Electrical—PVE (Extended only)

Electrical—PVE (Extended only) characteristics

Signal regulation U_s	U_s Minimum (50%)	0.37 to 0.63 at 100% movement
	U_s Maximum (200%)	0.25 to 0.75 at 50% movement
Dead band compensation	U_s Minimum	0.00
	U_s Maximum	0.06

Electrical—CAN, CAN+, and CANalog

Electrical—CAN, CAN+, and CANalog characteristics

Sensor type	Hall effect with redundant sensors
	Potentiometer
Resolution	12 bit
Supply voltage (V_s)	9 to 36 V_{DC}
Output	J1939 and CANopen protocols
Can+ Sensor Power	5.0 V_{DC} +/- 5% at 250 mA
CANalog volt reference	5.0 V_{DC} +/- 5% at 50 mA
Base maximum current consumption	120 mA at 9 V
CANalog analog outputs	0.5 to 4.5 V_{DC} at 1 mA max

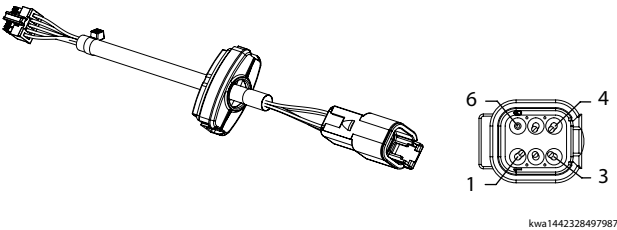
Electrical installation

Connector options and cabling

One 6 pin connector

Used only on CAN base.

Cabling and pin location: One 6 pin DEUTSCH DTM04 connector



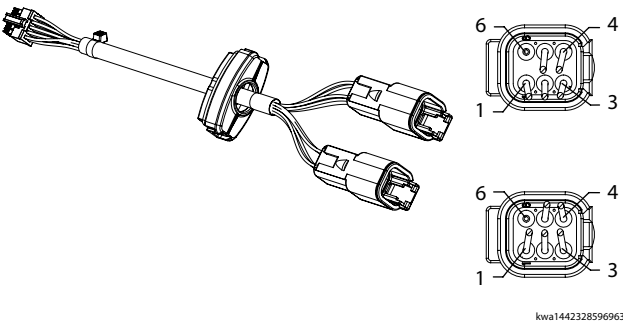
One 6 pin pinout

Wire color	DEUTSCH DTM04 6 pin	Function
White	1	Ground
Brown	2	Power
Green	3	CAN high
Yellow	4	CAN low
Grey	5	CAN shield
NC	6	NC

Two 6 pin connectors

Used only on CAN base.

Cabling and pin location: Two 6 pin DEUTSCH DTM04 connectors



Two 6 pin pinout

Wire color	DEUTSCH DTM04 6 pin	DEUTSCH DTM04 6 pin	Function
White	1		Ground
Brown	2		Power
Green	3		CAN high
Yellow	4		CAN low
Grey	5		CAN shield
NC	6		NC
Pink		1	Ground
Blue		2	Power
Red		3	CAN high

Electrical installation

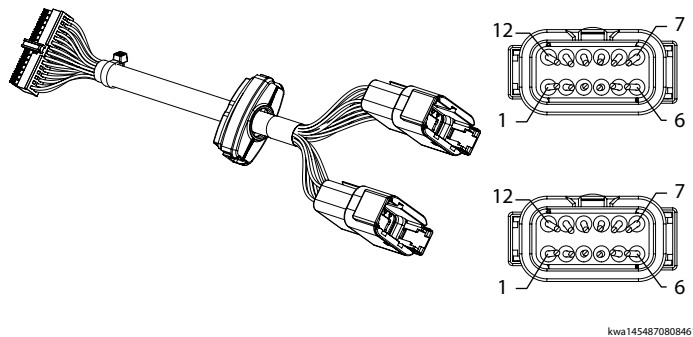
Two 6 pin pinout (continued)

Wire color	DEUTSCH DTM04 6 pin	DEUTSCH DTM04 6 pin	Function
Black		4	CAN low
Violet		5	CAN shield
NC		6	NC

Two 12 pin connectors

Used only on CANalog, CAN+, PVE, Analog Cat 1, and Analog Cat 3 Standard base.

Cabling and pin location: Two 12 pin DEUTSCH DTM04 connectors



Standard, 12 pin A pinout

Wire color	DEUTSCH DTM04 12 PIN	PVE Standard	CANalog	CAN+	Analog Cat 1	Analog Cat 3
White	1	GND	GND	GND	GND	GND_ANA1
Brown	2	PWR	PWR	PWR	PWR_ANA	PWR_ANA1 (+5V only)
Yellow-Grey	3	CAN high	CAN high	CAN high	Y1 (Prop 1)	Y1 (Prop 1)
Pink-Green	4	CAN low	CAN low	CAN low	X1 (Prop 2)	X1 (Prop 2)
Grey	5	CAN shield	CAN shield	CAN shield	Analog 3A	Analog 3A
Violet	6	Proportional Y	NC	NC	Analog 4A	Analog 4A
Grey-Pink	7	Proportional X	Grip analog 3a	A/D 1	Button 1	Button 1
Red-Blue	8	Proportional 3	Grip analog 3b	A/D 2	Button 2	Button 2
White-Red	9	Push 7	Reference ground	Sensor ground	Button 3	Button 3
Brown-Red	10	Push 8	5V reference	Sensor power	Button 4	Button 4
Green	11	PVE power (neutral switch)	Grip analog 1a	A/D 3	PWR_ANA	PWR_ANA2 (+5V Only)
White-Yellow	12	PVE power feedback	Grip analog 1b	A/D	GND	GND_ANA2

Standard, 12 pin B pinout

Wire color	DEUTSCH DTM04 12 PIN	PVE Standard	CANalog	CAN+	Analog Cat 1	Analog Cat 3
Pink	1	Direction Ya	NC	Digital input 7	NC	NC
Blue	2	Direction Yb	NC	NC	NC	NC
Red	3	Direction Xa	NC	NC	Y2	Y2
Black	4	Direction Xb	NC	NC	X2	X2
White-Grey	5	Push 1	NC	NC	Analog 3B	Analog 3B

Electrical installation

Standard, 12 pin B pinout (continued)

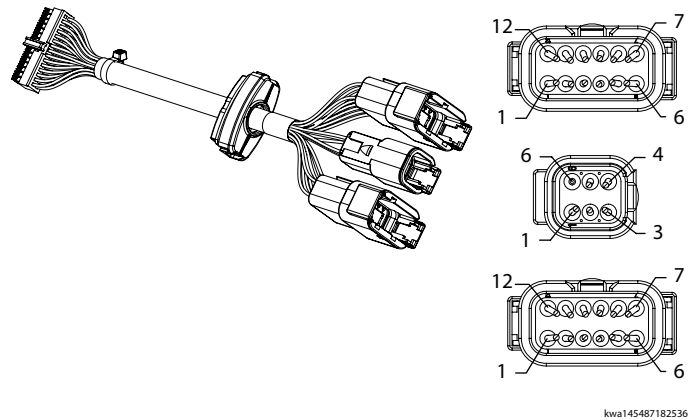
Wire color	DEUTSCH DTM04 12 PIN	PVE Standard	CANalog	CAN+	Analog Cat 1	Analog Cat 3
Grey-Brown	6	Push 2	NC	NC	Analog 4B	Analog 4B
White-Green	7	Proportional 4	Grip analog 2a	Digital input 1	Button 5	Button 5
White-Pink	8	Push 3	Grip analog 2b	Digital input 2	Button 6	Button 6
Pink-Brown	9	Push 4	Y1	Digital input 3	Button 7	Button 7
Brown-Green	10	Proportional 5	X1	Digital input 4	Button 8 / OPS	Button 8 / OPS
White-Blue	11	Direction 5a	Y2	Digital input 5	Analog 5A	Analog 5A
Brown-Blue	12	Direction 5b	X2	Digital input 6	Analog 5B	Analog 5B

Electrical installation

Two 12 pin and one 6 pin connectors

Used only on PVE Extended base.

Cabling and pin location: Two 12 pin and one 6 pin DEUTSCH DTM04 connectors



Extended, 12 pin A pinout

Wire color	DEUTSCH DTM04 12 PIN	PVE	Analog Cat 1	Analog Cat 3
White	1	Ground	GND	GND_ANA1
Brown	2	Power	PWR_ANA	PWR_ANA1 (+5V only)
Yellow-Grey	3	CAN high	Y1 (Prop 1)	Y1 (Prop 1)
Pink-Green	4	CAN low	X1 (Prop 2)	X1 (Prop 2)
Grey	5	CAN shield	Analog 3A	Analog 3A
Violet	6	Proportional Y	Analog 4A	Analog 4A
Grey-Pink	7	Proportional X	Button 1	Button 1
Red-Blue	8	Proportional 3	Button 2	Button 2
White-Red	9	Push 7	Button 3	Button 3
Brown-Red	10	Push 8	Button 4	Button 4
Green	11	PVE power (neutral switch)	PWR_ANA	PWR_ANA2 (+5V Only)
White-Yellow	12	PVE power feedback	GND	GND_ANA2

Extended, 12 pin B pinout

Wire color	DEUTSCH DTM04 12 PIN	PVE Standard	Analog Cat 1	Analog Cat 3
Pink	1	Direction Ya	NC	NC
Blue	2	Direction Yb	NC	NC
Red	3	Direction Xa	Y2	Y2
Black	4	Direction Xb	X2	X2
White-Grey	5	Push 1	Analog 3B	Analog 3B
Grey-Brown	6	Push 2	Analog 4B	Analog 4B
White-Green	7	Proportional 4	Button 5	Button 5
White-Pink	8	Push 3	Button 6	Button 6
Pink-Brown	9	Push 4	Button 7	Button 7
Brown-Green	10	Proportional 5	Button 8 / OPS	Button 8 / OPS
White-Blue	11	Direction 5a	Analog 5A	Analog 5A
Brown-Blue	12	Direction 5b	Analog 5B	Analog 5B

Electrical installation

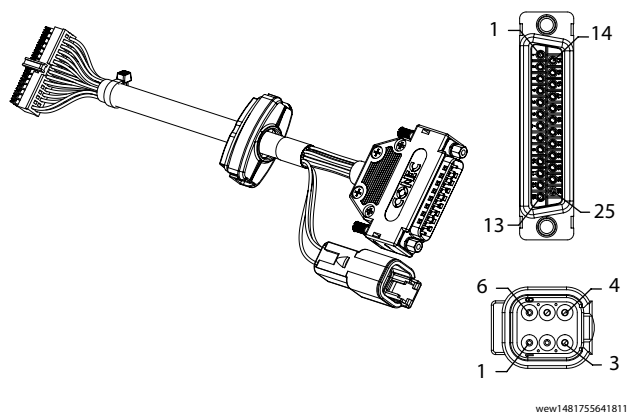
Extended, 6 pin pinout

Wire color	DEUTSCH DTM04 6-pin	PVE	Analog Cat 1	Analog Cat 3
Yellow-Brown	1	Power	Button 9	Button 9
White-Black	2	Push 9	Button 10	Button 10
Brown-Black	3	Push 10	Button 11	Button 11
Grey-Green	4	Push 11	Button 12	Button 12
Yellow	5	Push 12	open	open
NC	6	NC	NC	NC

One 25 pin SUB-D and one 6 pin connectors

Used only on PVE base.

Cabling and pin location: One 25 pin SUB-D and one 6 pin DEUTSCH DTM04 connectors; Code number: 11173403-T



25 pin SUB-D pinout

Wire color	25 pin SUB-D	Function
Green	1	PVE power (neutral switch)
Green	2	PVE power (neutral switch)
Brown	3	Power
White-Blue	4	Direction 5a
Red-Blue	5	Proportional 3
White-Grey	6	Direction 3a/Push 1/
Violet	7	Proportional Y
Grey-Pink	8	Proportional X
Red	9	Direction Ya
White-Yellow	10	PVE Power feedback
Blue	11	Direction Xb
Brown-Red	12	Push 8
White-Red	13	Push 7
Green	14	PVE power (neutral switch)
Brown	15	Power
Yellow-Brown	16	Power
White-Grey	17	Direction 5b
White-Green	18	Proportional 4

Electrical installation

25 pin SUB-D pinout (continued)

Wire color	25 pin SUB-D	Function
Grey-Brown	19	Direction 3b/Push 2/
White-Pink	20	Direction 4a/Push 3/
Pink-Brown	21	Direction 4a/Push 4/
White	22	Ground
Black	23	Direction Yb
Pink	24	Direction Ya
NA	25	NC

6 pin DEUTSCH DTM04 pinout

Wire color	6 pin DEUTSCH DTM04	Function
White	1	NC
Brown	2	NC
Yellow-grey	3	CAN high
Pink-green	4	CAN low
Grey	5	CAN shield
NC	6	NC

Mating connectors bag assemblies

(Must be ordered separately from joystick.)

Danfoss connector bag assemblies part numbers

Description	Danfoss part number
One 6 pin DEUTSCH connector	10101551
Two 6 pin DEUTSCH connectors	11177980
Two 12 pin DEUTSCH connectors (GRY/BLK)	10100945
Two 12 pin and One 6 pin DEUTSCH connectors (GRY/BLK)	11176538

DEUTSCH mating connector bag assemblies contents

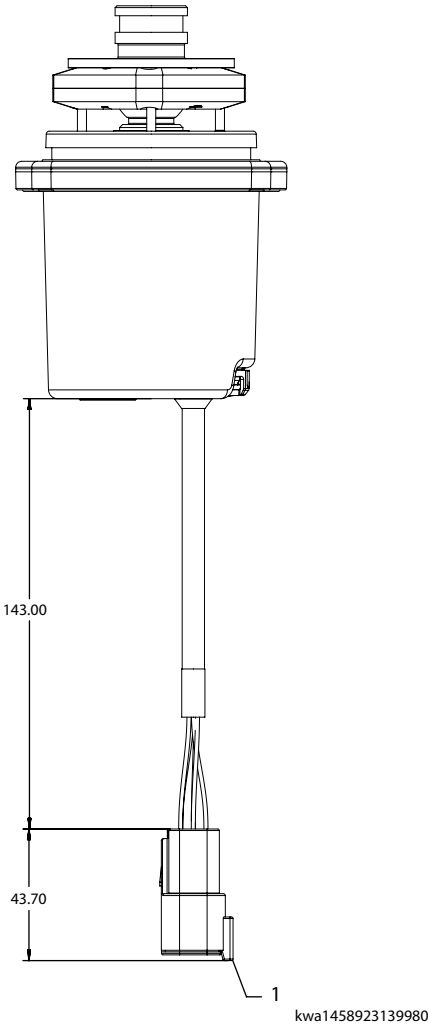
Description	6 pin module	12 pin module (GRY)	12 pin module (BLK)
Crimp tool	HDT-48-00	HDT-48-00	HDT-48-00
Contacts	0462-201-2031	0462-201-2031	0462-201-2031
Connector plug	DTM06-6S,GRY	DTM06-12SA, GRY	DTM06-12SB, BLK
Wedge	WM-6S	WM-12S	WM-12S
Strip length	3.96 to 5.54 mm (0.156 to 0.218 in)	3.96 to 5.54 mm (0.156 to 0.218 in)	3.96 to 5.54 mm (0.156 to 0.218 in)
Rear seal maximum insulation OD	3.05 mm (0.120 in)	3.05 mm (0.120 in)	3.05 mm (0.120 in)
Sealing plugs	0413-204-2005	0413-204-2005	0413-204-2005

Electrical installation

Cable assemblies

All cable assemblies for JS1-H are 185 mm from the bottom of the case to the end of the connector.

JS1-H cable length in millimeters



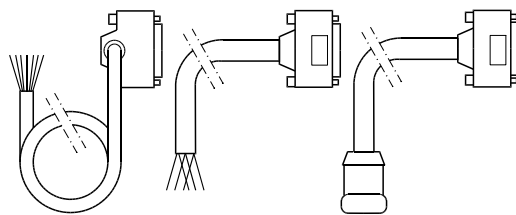
1. DEUTSCH DTM04 receptacle

Compatible mating cables available for different applications

Code no. 162B....	Length mm	Plug type	Type
6013	4000	Leads	Vertical SUB-D
6014	4000	Leads	Horizontal SUB-D
6015	500	Clipper	–
6016	230	TRIM TRIO	–
6017	230	Tabs	PVRE compatibility

Electrical installation

Cable assemblies - first is vertical view, followed by horizontal views



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Local address:

**Danfoss
Power Solutions (US) Company**
2800 East 13th Street
Ames, IA 50010, USA
Phone: +1 515 239 6000

**Danfoss
Power Solutions GmbH & Co. OHG**
Krokamp 35
D-24539 Neumünster, Germany
Phone: +49 4321 871 0

**Danfoss
Power Solutions ApS**
Nordborgvej 81
DK-6430 Nordborg, Denmark
Phone: +45 7488 2222

**Danfoss
Power Solutions Trading
(Shanghai) Co., Ltd.**
Building #22, No. 1000 Jin Hai Rd
Jin Qiao, Pudong New District
Shanghai, China 201206
Phone: +86 21 3418 5200

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