ENGINEERING TOMORROW

Data Sheet

Joystick
JS1 Heavy Duty Joysticks

Mobile Machine Management

The JS1 Heavy Duty Joysticks (JS1-H) portfolio is a modular joystick design that allows complete grip and base configuration for efficient control of any machine. The heavy duty design will result in extended life for years of reliable operation.

Five different heavy duty grips can be paired with the JS1-H base to offer the operator complete comfort. Each of the grips can be configured with a comprehensive portfolio of finger functions for true customization.

The JS1-H base incorporates proven Danfoss design elements and builds on the PLUS+1® architecture. Several options are available for the electrical and mechanical output so the joystick can be tailored for a positive human machine interaction. The JS1-H base is designed to be dependable and reliable for the extreme and harsh conditions of the mobile machine environment.

Features

- Hall effect with two sensors per axis or long life potentiometer position sensing
- Simultaneous operation of two proportional rollers
- Operator Presence switch

Options

Axis
- Dual axis
- Single axis
- Single axis with friction

Output options
- CAN J1939
- CANopen
- PVE
- CANalog
- CAN+
- Analog Category 1
- Analog Category 3

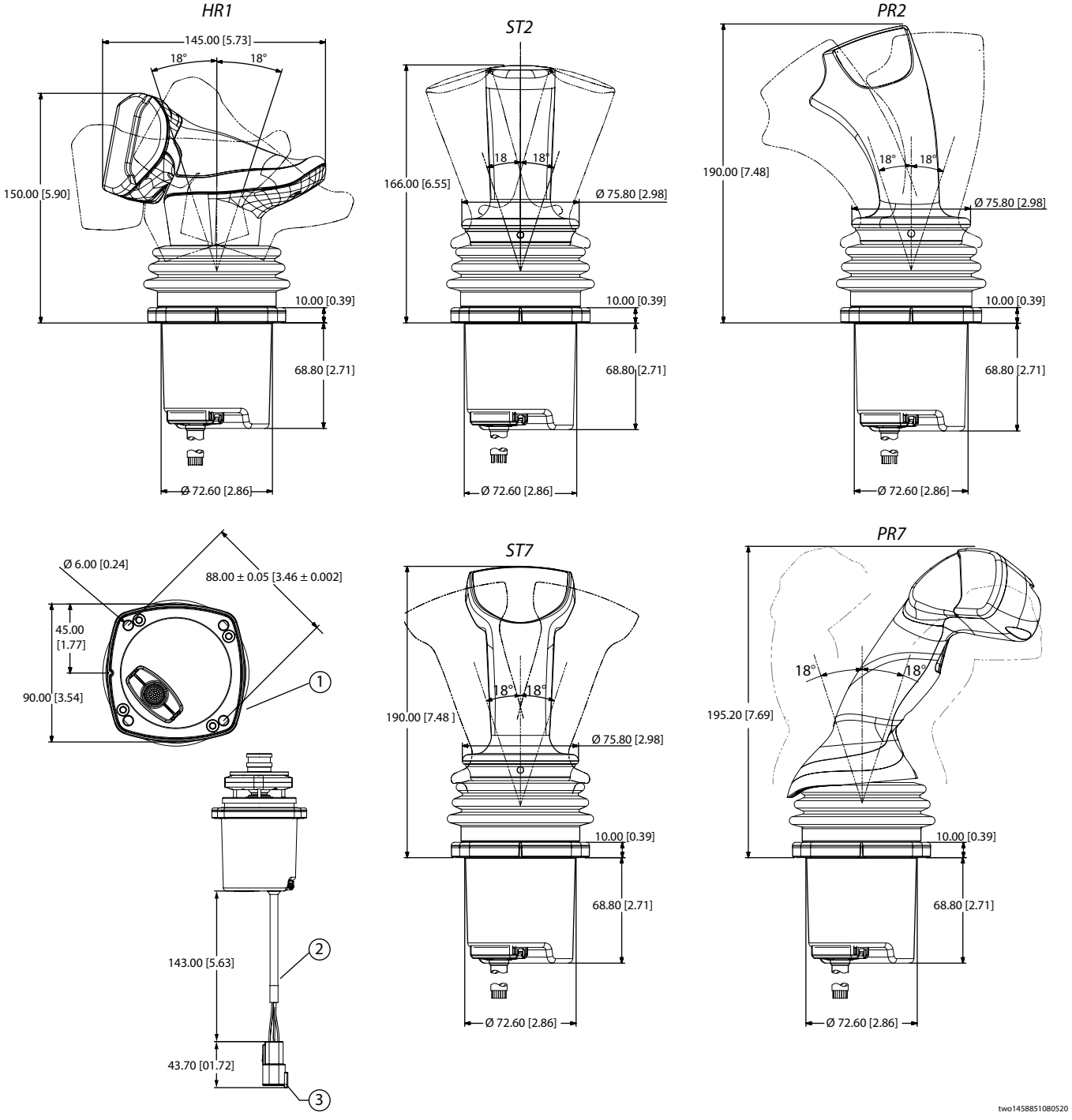
Ergonomic grip
- Right hand
- Left hand
- Ambidextrous (used with either the left or right hand)

On axis shaft, deflection
- ±18°

JS1-H grips
- HR1
- ST2
- ST7
- PR2
- PR7

Comprehensive technical literature is online at *powersolutions.danfoss.com*

Dimensions in millimeters [inches]



1. Bottom view

2. Cable harness (included) based on specific options, see *JS1 Heavy Duty Joysticks Technical Information*, **BC00000347**

Mechanical characteristics

Shaft mechanical angle limits	± 18˚
Base mechanical life	Single axis with friction = 1 million full operating cycles
	Single axis and dual axis with spring return = 2.0 million full operating cycles
Maximum force on handle	1000 N
Maximum torque	15 Nm
Base only mass	0.75 kg (1.65 lbf)
Weight (base without grip)	725 G (1.8 lb)
Vertical maximum load	6000 N (1350 lbs)

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_+

Electrical—PVE (Extended only) characteristics

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

Electrical—Analog Cat 1, Cat 3 characteristics

Sensor type	Hall effect with redundant sensors
Supply voltage (Vs)	4.5 to 5.5 V_{DC}
Output	10 to 90% of input voltage
Output impedance	1 mA max output current at 200 Ohm output impedance
Digital outputs	Vs-0.3 V_{DC}, maximum current 100 mA

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

Environmental characteristics

Operating temperature	CAN, CANalog, CAN+, Analog Cat1, Analog Cat3	-30° C to 80° C (-22° F to 176° F)
	PVE	-30° C to 70° C (-22° F to 158° F)
Storage temperature	-40° C to 85° C (-40° F to 185° F)	
EMI/RFI rating	150 V/m	
Vibration	25 G, 10 ms, 500 bumps in each of 6 directions IEC 60068-2-29 test Eb	
Shock	50 G, 11 ms, 3 shocks in each of 6 directions IEC 60068-2-29 test Ea	
Ingress Protection (IP) rating	Up to IP 66 (dependent on grip sealing selected)	

Danfoss part numbers for JS1 Heavy Duty Joysticks, refer to:

JS1 Heavy Duty Joystick Family Technical Information	**BC00000347**

Danfoss connector bag assemblies part numbers
(Must be ordered separately from joystick.)

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