MECHANICAL
POSITION DETECTORS

Limit switch

IN ALL CASES, CROUZET WILL FIND A WAY!

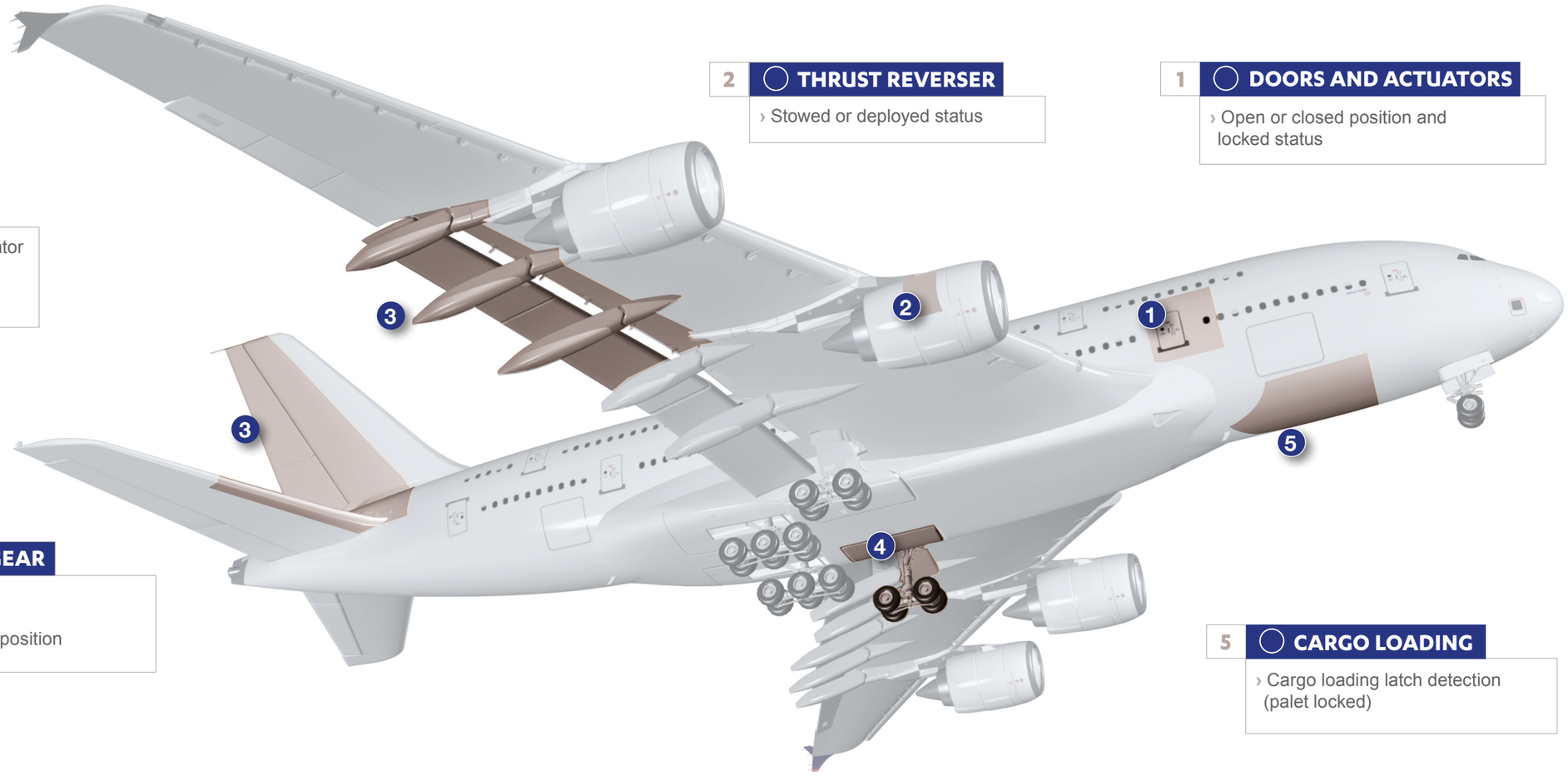
with Crouzet's expertise in mechanical position detectors, Crouzet offers a range of standard product, but has the ability and capacity to develop specific components, entirely adapted to the application into its environment.

Today, Crouzet is a market leader in this technology for customised products.

CROUZET PROVIDES UPON REQUEST:

- Hermetic cells
- Special housings
- Cable or connector output
- Multi-pole functions
- Multi-actuation systems
- High speed actuation
- High temperature devices

Limit switches



2 THRUST REVERSER
- Stowed or deployed status

1 DOORS AND ACTUATORS
- Open or closed position and locked status

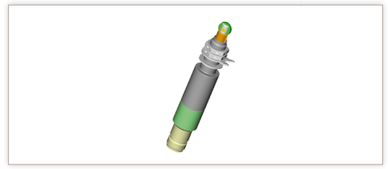
3 FLIGHT CONTROL
- Trimable Horizontal Stabilizer Actuator
- Spoilers
- Flap & slat

4 LANDING GEAR
- Weight on wheels
- Up position
- Down and locked position

5 CARGO LOADING
- Cargo loading latch detection (palet locked)

LIMIT SWITCH

FOR THRUST REVERSER DOOR TERTIARY LOCK FUNCTION



Specifications

Part numbers **DDP770375**

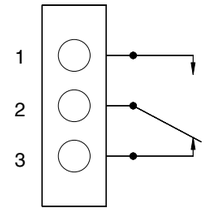
Summary of environmental conditions		
Condition	**RTCA / DO-160E**	**Requirement**
Operating low temperature	Section 4	Category F3 (-40 °F / -40 °C)
Operating high temperature	Section 4	Category F3 (+225 °F / +108 °C)
Short-time operating temperature	Section 4	Category F3 (+225 °F / +108 °C)
Ground survival low temperature	Section 4	Category F3 (-67 °F / -55 °C)
Ground survival high temperature	Section 4	Category F3 (+250 °F / +121 °C)
Temperature variation	Section 5	Category A
Thermal shock	-	2 hours @ -67 °F (-55 °C), Operation: 5 cycles within 1 min
Altitude	Section 4	Category F3 (-2 000 to +55 000 feet)
Humidity, Waterproofness and Icing	-	CET Method I or II test
Operational shock	Section 7	Category A
Crash shock	Section 7	Category A
Vibration	Section 8	Category R, Curve W
Explosion	Section 9	Environment I, Category A
Fluid susceptibility	Section 11	Category F
Sand and Dust	Section 12	Category D
Fungus resistance	Section 13	Category F
Salt fog	Section 14	Category T
Magnetic effects	Section 15	Category Z
Power input	Section 16	Category A
Voltage spike	Section 17	Category A
Audio frequency conducted susceptibility	Section 18	Category Z
Induced signal susceptibility	Section 19	Category Z
Radio frequency susceptibility	Section 20	Category W
Emission of radio frequency energy	Section 21	Category H
Lightning-induced transient susceptibility	Section 22	Category A4 / C4
ESD susceptibility	Section 25	Category A
Flammability	Section 26	Category A

Electrical characteristics	
Minimum Operational voltage	12 VDC
Maximum Operational voltage	32 VDC
Close circuit current	2 to 500 mA
Min. Open circuit resistance (Dry)	100 000 Ω
Max. Closed circuit resistance	10 Ω
Bonding resistance: (connector to switch body)	2.5 mΩ new, 10 mΩ field service
Contacts	Gold, hermetically sealed
Insulation resistance	100 MΩ min at 68 °F (20 °C) at 500 V DC for 60 sec.
Dielectrical withstanding	1 060 V rms / 50-60 Hz / 60 s (II < 1 mA)

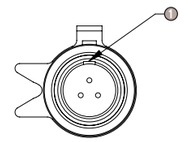
Mechanical characteristics	
Plunger impact speed	19 in / s (0,5 m / s) Max.
Impact angle	6° Max.
Actuator speed	150 in / s (4 m / s) Max.
Shock	< 100 G 11 ms
Weight	0.3 lb (130 g) Max.
Mechanical lifetime	120 000 Cycles TBC
Differiential travel	0.010 in (0.254mm) Max.
Over travel	0.118 in (3 mm) Min.
Operating force	6-12 lb (27-54 N)
Full over travel force	20 lb (90 N) Max.
Release force	3.4 lbs (15 N) Min.

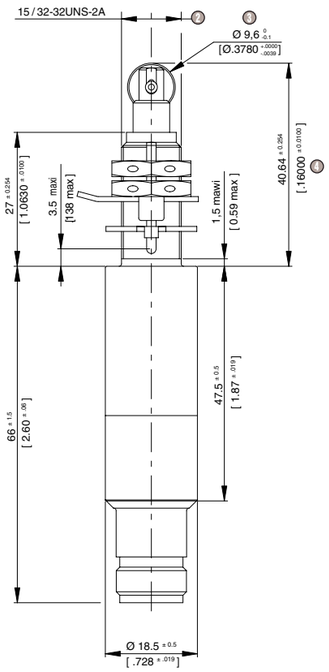
Principles

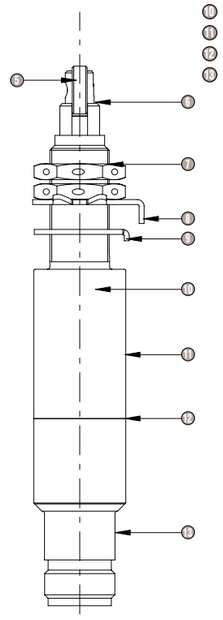
Electrical shematic (switch in free position)



Dimensions (mm)



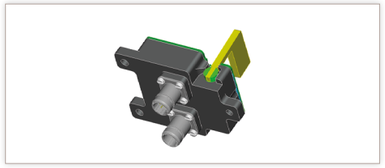




1. Master keyway location to bushing keyway
2. 15 / 32-32UNS-2A
3. Roller material: CuNi14Al2
4. Switching point
5. Roller orientation location to keyway slot: 90°±5°
6. Plunger stainless steel
7. (2x) steel nut MS21340-04
8. Lockwasher MS9582-14
9. Tabwasher MS25081-C4 or equivalent
10. Laser marking
11. Housing stainless steel AISI 303 (2 welding parts)
12. Watertight welding cordon
13. Connector per 8000 YE10803 PN-M108 stainless steel

CUSTOMIZED PRODUCTS

LIMIT SWITCH
FOR THRUST REVERSER DOOR STOW FUNCTION



Specifications

Part numbers **DDP990202**

Summary of environmental conditions

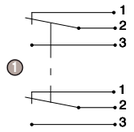
Condition	RTCA/DO-160E	Requirement
Operating low temperature	Section 4	Category F3 (-40 °F/-40 °C)
Operating high temperature	Section 4	Category F3 (+225 °F/+108 °C)
Short-time operating temperature	Section 4	Category F3 (+225 °F/+108 °C)
Ground survival low temperature	Section 4	Category F3 (-67 °F/-55 °C)
Ground survival high temperature	Section 4	Category F3 (+250 °F/+121 °C)
Altitude	Section 4	Category F3 (-2 000 to +55 000 feet)
Temperature variation	Section 5	Category A
Humidity	Section 6	Category C
Operational shock	Section 7	Category B
Crash shock	Section 7	Category B
Vibration	Section 8	Category R, Curve W
Explosion	Section 9	Environment I Category A
Waterproofness	Section 10	Category S
Fluid susceptibility	Section 11	Category F
Sand and Dust	Section 12	Category D
Fungus resistance	Section 13	Category F
Salt spray	Section 14	Category T
Magnetic effects	Section 15	Category Z
Power input	Section 16	Category A
Voltage spike	Section 17	Category A
Audio frequency conducted susceptibility	Section 18	Category Z
Induced signal susceptibility	Section 19	Category Z
Radio frequency susceptibility	Section 20	Category W
Emission of radio frequency energy	Section 21	Category H
Lightning induced transient susceptibility	Section 22	Category A4/C4
Icing	Section 24	Category A
ESD susceptibility	Section 25	Category A

Electrical characteristics	
Minimum operational voltage	12 VDC
Nominal operational voltage	28 VDC
Maximum operational voltage	32 VDC
Close circuit current	2 mA to 10 mA
Min. Open circuit resistance (dry)	50 KΩ
Max. Closed circuit resistance	30 Ω
Bonding resistance (connector housing to switch body)	2.5 mΩ new 10 mΩ field service
Contacts	Gold, hermetically sealed
Insulation resistance	100 MΩ min at 68 °F (20 °C) at 500 V DC for 60 sec.
Dielectrical withstanding	1 060 V rms/50-60 Hz/60 s (II < 1 mA)
Sealing	Watertight: MIL PRF 8805 S3

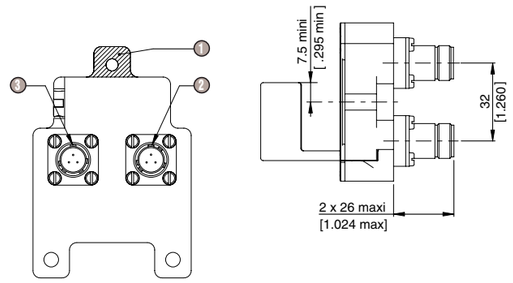
Mechanical characteristics	
Weight	0.670 lb (0.304 kg) max
Mechanical lifetime	60 000 Cycles
Release force	4.5 lb (21 N) max
Operating force	6-12 lb (27-54 N)
Full over travel force	20 lb (90 N) max

Principles

Circuit diagram (switch show in free position)

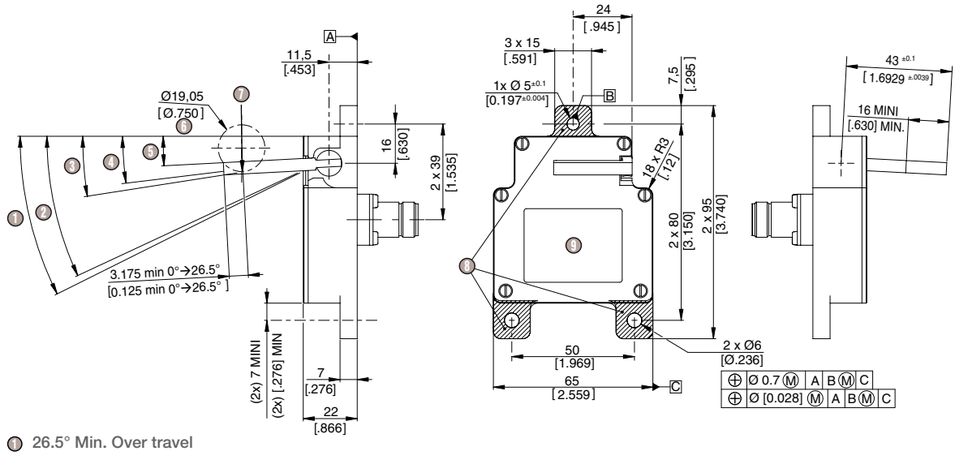


① Gold contacts



① Bonding surface optional
② Connectors EN2997-Y00803M6
Master key orientation ±10°
③ Connectors EN2997-Y00803MN
Master key orientation ±10°

Dimensions (mm)

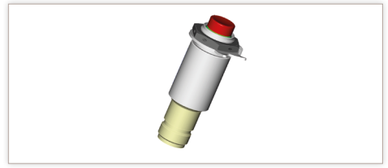


① 26.5° Min. Over travel
② 25° Max. Overstow position
③ 9° Max. Min. Stow position
④ 6.5°±1.5 s Switch point
⑤ 3.5° -0.5°/+1° Rest position
⑥ Roller
⑦ Force
⑧ Bonding surface (3x)
⑨ Electrochemicaly or Laser marking area

CUSTOMIZED PRODUCTS

LIMIT SWITCH

FOR THRUST REVERSER MAINTENANCE TEST ENABLE FUNCTION



Specifications

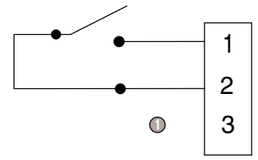
Part numbers **DDP770384**

Summary of environmental conditions		
Condition	**RTCA/DO-160E**	**Requirement**
Operating low temperature	Section 4	Category F3 (-40 °F/+40 °C)
Operating high temperature	Section 4	Category F3 (+225 °F/+108 °C)
Short-time operating high temperature	Section 4	Category F3 (+225 °F/+108 °C)
Ground survival low temperature	Section 4	Category F3 (-67 °F/-55 °C)
Ground survival high temperature	Section 4	Category F3 (+250 °F/+121 °C)
Altitude	Section 4	Category F3 (-2 000 to +55 000 feet)
Temperature variation	Section 5	Category A
Operational shock	Section 7	Category B
Crash shock	Section 7	Category B
Vibration	Section 8	Category R, Curve W
Explosion proofness	Section 9	Environment I Category A
Fluid susceptibility	Section 11	Category F
Sand and Fog	Section 12	Category D
Fungus resistance	Section 13	Category F
Salt spray	Section 14	Category T
Magnetic effects	Section 15	Category Z
Power input	Section 16	Category A
Voltage spike	Section 17	Category A
Audio frequency conducted susceptibility	Section 18	Category Z
Induced signal susceptibility	Section 19	Category Z
Radio frequency susceptibility	Section 20	Category W
Emission of radio frequency energy	Section 21	Category H
Lightning-induced transient susceptibility	Section 22	Category A4/C4
ESD susceptibility	Section 25	Category A
Flammability	Section 26	Category A
Thermal shock	/	Stab. 2h at -67 °F, 5 cycles within 1 min
Combined environment test	/	Method II

Electrical characteristics	
Min. Operational voltage	12 VDC
Max. Operational voltage	32 VDC
Close circuit current	4 mA to 10 mA
Min. Open circuit resistance (Dry)	50 kΩ
Max. Closed circuit resistance	30 Ω
Bonding resistance (connector housing to switch body)	2.5 mΩ new, 10 mΩ field service
Contacts	Gold, hermetically sealed
Insulation resistance	100 MΩ min at 68 °F (20 °C) at 500 V DC for 60 sec.
Dielectrical withstanding	1 060 V rms/60 Hz/60 s (II < 1 mA)

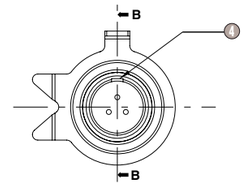
Mechanical characteristics	
Impact speed	19 in/s (0.5 m/s) max Operating: 4 in/s (0.1 m/s)
Weight	0.221 lb (0.100 kg) max
Mechanical lifetime	20 000 Cycles
Pre-travel	0.05 in (1.27 mm) max
Differiential travel	0.010 in (0.25 mm) max
Over travel	0.06 in (1.52 mm) min
Operating force	3.15 lb (14 N) max
Release force	0.68 lb (3 N) min
Full over travel force	6.07 lb (27 N) max

Principles

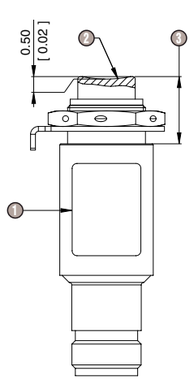


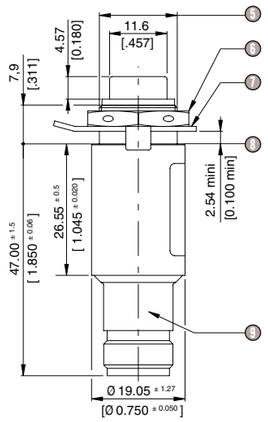
① Gold contacts

Dimensions (mm)



① Electrochemicaly or Laser marking
② SR 25.4 [1.00]
③ Rest position 13.70 [0.54]
④ Master keyway on connector ±10°
⑤ 0.625-24 UNEF-2A
⑥ Nut or equivalent: MS21340-05
⑦ Lockwasher or equivalent: MS9582-16
⑧ Bonding surface
⑨ Connector EN2997Y10803MN or equivalent





CUSTOMIZED PRODUCTS

LIMIT SWITCH
FOR THRUST REVERSER ACTUATOR FUNCTION

Specifications

Part numbers **DDP771009**

Summary of environmental conditions

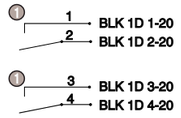
Condition	RTCA/DO-160E	Requirement
Operating low temperature	Section 4	Category F3 (-40 °F/-40 °C)
Operating high temperature	Section 4	Category F3 (+225 °F/+108 °C)
Short-time operating temperature	Section 4	Category F3 (+225 °F/+108 °C)
Ground survival low temperature	Section 4	Category F3 (-67 °F/-55 °C)
Ground survival high temperature	Section 4	Category F3 (+250 °F/+121 °C)
Altitude	Section 4	Category F3 (-2 000 to +55 000 feet)
Temperature variation	Section 5	Category A
Humidity	Section 6	Category C
Operational shock	Section 7	Category A
Crash shock	Section 7	Category A
Vibration	Section 8	Category R, Curve W
Explosion	Section 9	As required by design
Waterproofness	Section 10	Category S
Fluid susceptibility	Section 11	Category F
Sand and Dust	Section 12	Category D
Fungus resistance	Section 13	Category F
Salt spray	Section 14	Category T
Magnetic effects	Section 15	Category Z
Power input	Section 16	Category A
Voltage spike	Section 17	Category A
Audio frequency conducted susceptibility	Section 18	Category Z
Induced signal susceptibility	Section 19	Category Z
Radio frequency susceptibility	Section 20	Category W
Emission of radio frequency energy	Section 21	Category H
Lightning-induced transient susceptibility	Section 22	Category A4/C4
Icing	Section 24	Category A
ESD susceptibility	Section 25	Category A
Flammability	Section 26	Category A

Electrical characteristics	
Min. Operational voltage	14 VDC
Nominal operating voltage	28 VDC
Max. Operational voltage	32 VDC
Closed circuit current	2 mA to 500 mA
Min. Open circuit resistance (Dry)	500 000 Ω
Max. Closed circuit resistance	10 Ω
Contacts	Gold, hermetically sealed
Insulation resistance	100 MΩ Min. at 68 °F (20 °C) at 500 V DC for 60 sec.
Dielectrical withstanding	1 060 V rms/60 Hz/60 s (II < 1 mA)

Mechanical characteristics	
Impact speed	1 in/s (25.4 mm/s) Max.
Shock	< 100 G 11 ms
Weight	0.260 Lb (0.118 Kg) Max.
Mechanical lifetime	20 000 Cycles
Differiential travel	0.020 in (0.5 mm) Max.
Over travel	0.157 in (4 mm) Min.
Operating force	6-14 Lb (27-62.5 N)
Full over travel force	30 Lb (133 N) Max.
Release force	3.4 Lb (15 N) Min.

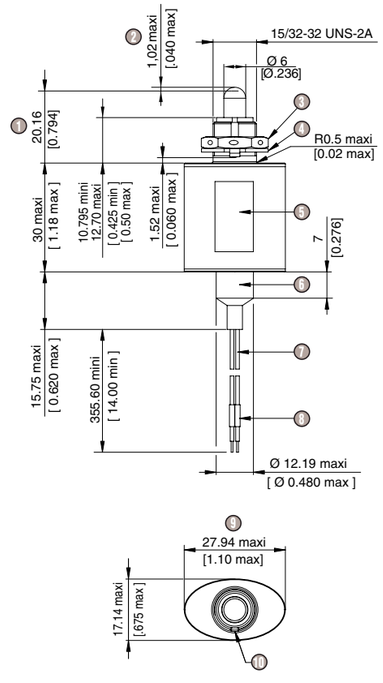
Principles

Circuit diagram (switch show in free position)



(1) Gold contacts

Dimensions (mm)



(1) Switch point
(2) Pre-travel
(3) Hex nuts MS21340-04 or equivalent
(4) Keying washer: MS25081-C4 or equivalent
(5) Laser or electrochemicaly etch
(6) Heat shrinkable boot per MIS-34867
(7) Wire 24 AWG per NEMA HP3
(8) Sleeves marks
(9) View without nut and washer
(10) Keyway: [.078 ±.003] wide, [.040 ±.002] deep

CUSTOMIZED PRODUCTS

LIMIT SWITCH

FOR TRIMMABLE HORIZONTAL STABILIZER ACTUATOR (THSA) FUNCTION

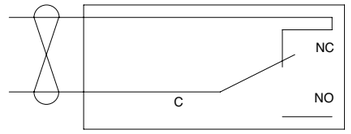
Specifications

Part numbers **DDP770345**

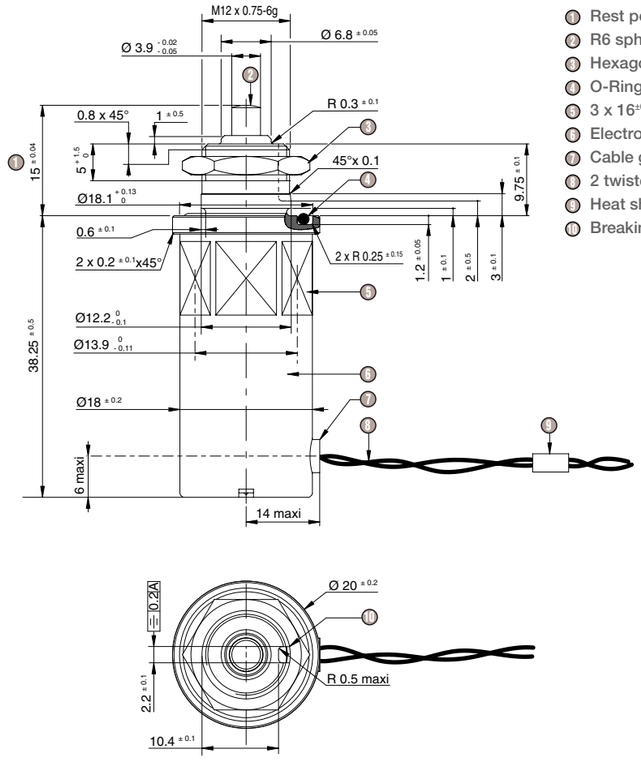
Environment characteristics	
Operating temperature	-55 °C to +90 °C
Number of cycles head on	200
Max. Pre-travel	0.5 mm
Max. Movement differential	0.06 mm
Min. Overtravel	3 mm
Operating force on all the range of temperature	10 to 30 N
Min. Release force	6 N
Max. Total travel force	72 N
Speed of attack	0.7 m/s Max.
Max. Coupling torque	5 N.m
Traction on wires	15 N Max.
Weight	90 g Max.
Storage limit time	10 Years See: NF L 17-103

Principles

Electrical scheme released in free position



Dimensions (mm)



1. Rest position
2. R6 spherical
3. Hexagonal nut 15 ±0.1 acrossflats thickness 2.5 ±0.05
4. O-Ring (in the supplier's envelope) MIL-R-25988 B
5. 3 x 16 ±0.1 across flats
6. Electrochemical marking
7. Cable grommet
8. 2 twisted wires AWG 24 length 1 000 ±50 MIL-W 16878/4
9. Heat shrink sleeve every 200 mm
10. Breaking of the edge to 0.2 all around the groove

LIMIT SWITCH
FOR SLAT FUNCTION

Specifications

Part numbers **DDP770348**

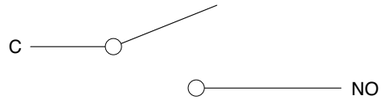
Mechanical characteristics

The characteristics are given for standard temperature (23 °C) and atmospheric pressure at the sea level (760 mm Hg)

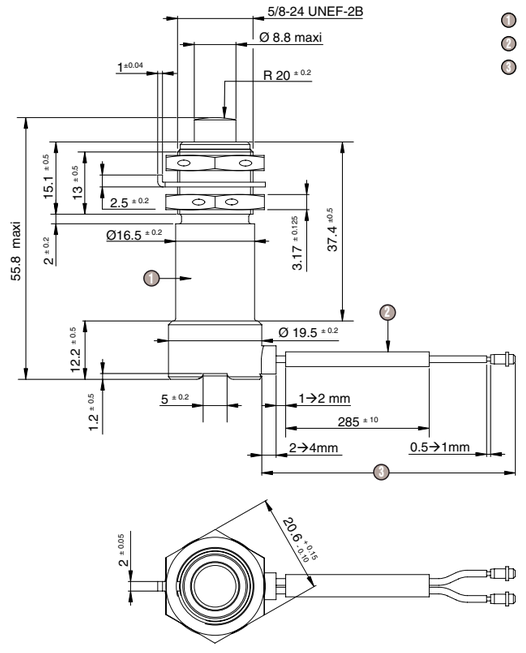
Operating temperature	-55 °C to +70 °C
Exceptionnal operation during 5 minutes	+85 °C
Storage temperature	-55 °C to +85 °C
Number of cycles head on	100 000
Max. Pre-travel	1 mm
Max. Movement differential	0.5 mm
Min. Overtravel	3 mm
Operating force	25 to 55 N
Max. total travel force	90 N
Weight	79 g Max.

Principles

Circuit diagram rest position



Dimensions (mm)



1. Electro etching marking
2. Sleeve DR25
3. 2 wires KZ05-07 AWG 20 length 336±5

LIMIT SWITCH
FOR THRUST REVERSER DOOR DEPLOY FUNCTION

Specifications

Part numbers **DDP771067**

Environment characteristics		
Conditions	**RTCA/DO-160D**	**Requirements**
Equipment intended for installation in powerpoint	Section 4.3	Category D3
Operating low temperature	Section 4	Category D3 -40 °C
Operating high temperature	Section 4	Category D3 +135 °C
Short time operating high temp.	Section 4	Category D3 +135 °C
Ground survival low temperature	Section 4	Category D3 -62 °C
Ground survival high temperature	Section 4	Category D3 +85 °C
Altitude	Section 4	Category D3 45000 ft
Temperature variation	Section 5	Category A
Humidity	Section 6	Category B
Operating shock	Section 7	Category B
Crash shock	Section 7	Category B
Vibrations	Section 8	Category H2
Explosion	Section 9	Category E2
Waterproofness	Section 10	Category R
Fluid susceptibility	Section 11	Category F Spray test
Sand and Dust	Section 12	Category D
Fungus resistance	Section 13	Category F
Salt spray	Section 14	Category S
Lightning induced transient susceptibility	Section 22	Category A4XX
Icing	Section 24	Category B

Electrical characteristics	
Normal Operating voltage	28 VDC
Max. Operating voltage	32 VDC
Normal Operating current	10 mA < I < 50 mA
Max. Operating current	100 mA
Contact resistance	125 mΩ Max.
Dielectric withstanding at atmospheric pressure	1 000 VRMS - 1 mA
Electrical bonding	2.5 mΩ between the bush and the beginning of the shield under the sleeve
Insulation resistance	100 MΩ at 500 VDC
Electrical Lifetime	100 000 Cycles
Contact bounce: (Checked during shocks and vibrations tests)	< 5 ms

Mechanical characteristics

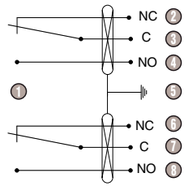
The characteristics are given for standard temperature (23 °C) and atmospheric pressure at the sea level (760 mm Hg).

Braided shield grounded to body of switch for 360°.

Operating force	to be less than 12 lbs
Pretravel	0.04 inch Max.
Differential travel	0.02 inch Max.
Overtravel	0.125 inch Min.
Mechanical lifetime	100 000 Cycles
Weight	300 g Max.
Operating attack speeds	0.5 m/s Max.
Outstanded Max. attack speeds permitted	0.7 m/s
Product sealing	Watertight
Cell sealing	Hermetic

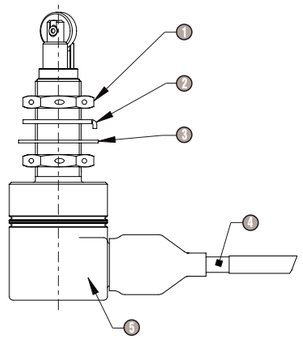
Principles

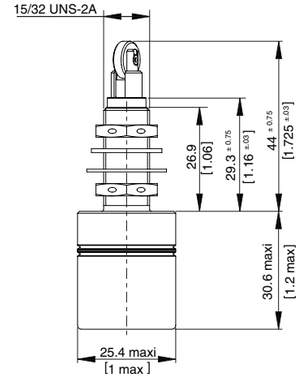
Circuit diagram (switch show in free position)

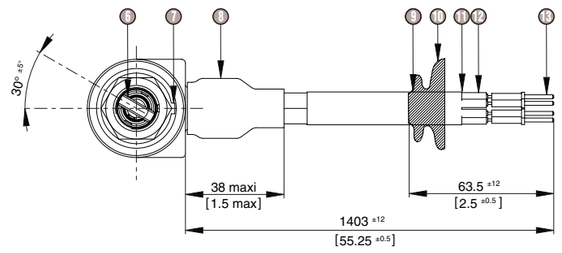


1. Gold contacts
2. Yellow Rep. 1
3. Blue Rep. 2
4. Red Rep. 3
5. Case Ground
6. Red Rep. 4
7. Blue Rep. 5
8. Yellow Rep. 6

Dimensions (mm)







9. Hex nut ref. MS21340-04
10. Keying washer ref. MS25081-C4
11. Flat washer ref. MS9549-14
12. Sheath do not penetrate under boot
13. Laser marking
14. Roller (CuNi) Ø.378 x .118
15. Keyway to within .15 of shoulder . 72 ±.004 wide x .31 ±.003 deep.
16. Heat-shrinkable sheath
17. Heat-shrinkable sheath
18. Shield (developed leng 3.35 Inches)
19. 2 cables per MIL27500-20RC3N06
20. Sleeve marks
21. Pin: M39029/58-363

CUSTOMIZED PRODUCTS

LIMIT SWITCH
FOR THRUST REVERSER ACTUATOR FUNCTION

Specifications

Part numbers **DDP770350**

Environment characteristics	
Temperature	RTCA DO-160C (SECT.4 CAT.D3)
Temperature variation	MIL-STD-810E
Altitude	RTCA DO-160C (SECT.4 CAT.D3)
Humidity	RTCA D0-160C (SECT.6 CAT.B)
Operational shock	RTCA DO-160C SECT.7
Crash safety	RTCA DO-160C SECT.7
Vibration	RTCA DO-160C SECT.8 CURVE W
Explosion proofness	RTCA DO-160C SECT.9 CAT.E Environment II
Waterproofness	RTCA DO-160C SECT.10 CAT.R
Fluid susceptibility	RTCA DO-160C SECT.11 CAT.F SPRAY TEST
Sand & Dust	RTCA DO-160C SECT.12 CAT.D
Fungus resistance	RTCA DO-160C SECT.13 CAT.F
Salt spray	RTCA DO-160C SECT.14 CAT.S
Lightning induced transient susceptibility	RTCA DO-160D SECT.22 CAT. A4××
Icing	RTCA DO-160C SECT.24 CAT. B

Electrical characteristics	
Normal Operating voltage	28 VDC
Max. Operating voltage	32 VDC
Normal Operating current	10 mA < I < 50 mA
Max. Operating current	100 mA
Contact resistance	≤ 260 mΩ
Dielectric strength at atmospheric pressure	1 000 VRMS - 1 mA
Electrical bonding	25 mΩ between the body and the beginning of the shield under the sleeve
Insulation resistance	100 MΩ 500 VDC
Electrical Lifetime: (according to C.CT.DEF.00060.GB)	100 000 Cycles
Contact bounce: (Checked during shocks and vibrations test)	< 5 ms

Mechanical characteristics

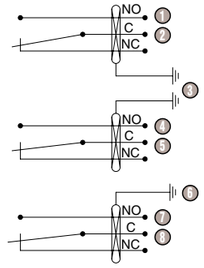
The characteristics are given for standard temperature (23 °C) and atmospheric pressure at the sea level (760 mm Hg).

Braided shield grounded to body of switch for 360°.

Operating force	6 to 12 lbs
Full overtravel force	20 lbs Max.
Release force	4 pound Min.
Pretravel	0.040 inch Max.
Differential travel	0.020 inch Max.
Overtravel	0.125 inch Min.
Operating temperature	-55 °C to +150 °C
Operating attack speeds	0.5 m/s Max.
Attack speeds permitted	0.7 m/s Max.
Mechanical lifetime (according QTP: C.CT. DCO.00060.GB)	100 000 cycles
Weight	265 g Max.

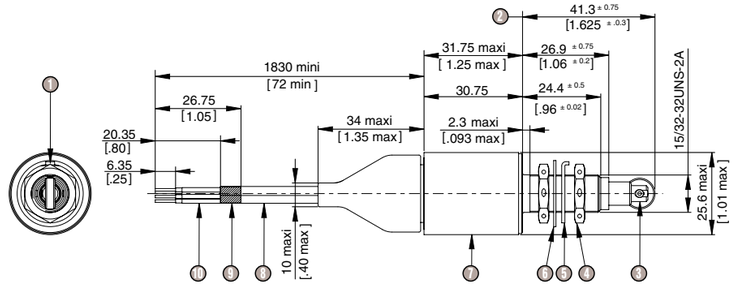
Principles

Circuit diagram (switch show in free position)



1. Blue stripe Rep.7
2. White Rep.8
3. Case ground
4. Blue stripe Rep.9
5. White Rep.10
6. Case ground
7. Blue stripe Rep.11
8. White Rep.12

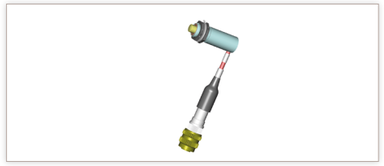
Dimensions (mm)



1. Keyway to within .250 of shoulder .72 ±.004 wide x .031 ±.003 deep Roller is aligned with keyway: ±5°
2. Free position
3. Corrosion resistant material (CuNi) Ø.378/.374 x .118
4. 2 x Hex nut per MS21340-04
5. 1 x Keying washer per MS25081C4
6. 1 x Flat washer per MS9549-14
7. Laser marking
8. 3 cables per MIL27500-22 RC2N06
9. Shield
10. Sleeve marks at the end of wires

CUSTOMIZED PRODUCTS

LIMIT SWITCH
FOR THRUST REVERSER ACTUATOR FUNCTION



Specifications

Part numbers **DDP990175**

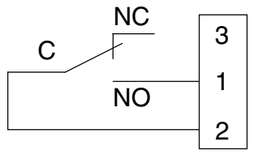
Environment characteristics	
Operating low temperature	-67 °F
Operating high temperature	+257 °F
Number of cycles head on	80 000

Electrical characteristics	
Open circuit voltage	17 VDC Max. 9 VDC Min.
Closed circuit current	2 to 20 mA

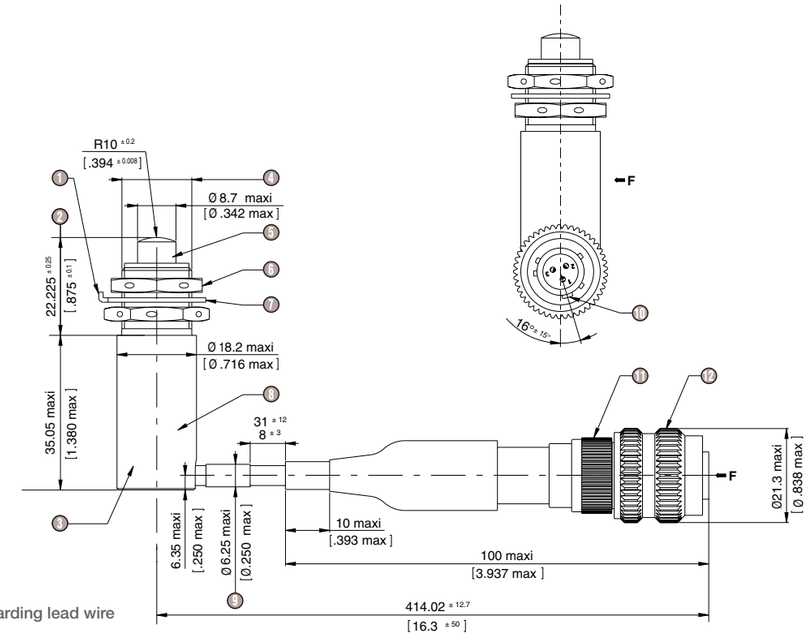
Mechanical characteristics	
Max. Pre-travel	0.040 in
Max. Differential travel	0.020 in
Min. Overtravel	0.125 in
Operating force	6-12 lbs
Max. Over travel force	20 lbs

Principles

Electrical diagram (switch show in free position)



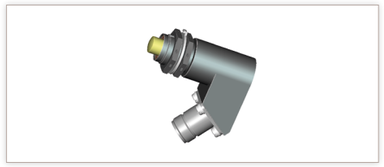
Dimensions (mm)



1. Lug washer ±10° regarding lead wire
2. Free position
3. Stainless steel body AISI 304L
4. 5/8-24 UNEF-2B
5. Stainless steel AISI 630
6. MS21340-05 nut Qty2
7. MS25081 C5 washer
8. Marking chemical etching
9. After shrinking
10. Angular position master key
11. Stainless steel with a electroless nickel finish banding backshell Be assembled to connector with 50-60 inch Lb torque
12. Stainless steel connector EN2997-S6-08-03M6

CUSTOMIZED PRODUCTS

LIMIT SWITCH
FOR THRUST REVERSER ACTUATOR FUNCTION



Specifications

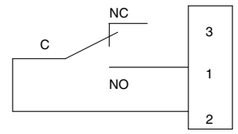
Part numbers **DDP770364**

Environment characteristics		
Condition	**RTCA/DO-160D Section**	**Category**
Ground survival low temp. Operating low temperature	4	D3 at -67 °F (- 55 °C)
Ground survival high temp. Short time operating high temp. Operating high temperature	4	D3 at 257 °F (125 °C)
Altitude		-2 000 to 41 000 ft
Temperature variation	5	A
Humidity	6	C
Operational shock	7	B
Crash shock	7	B para 7.3.2 type 2
Vibration	8	R figure 8-2, curve W with 20 G to 3 000 Hz
Explosion proof	9	E2
Waterproofness	10	S
Fluid susceptibility	11	F (COMPATIBLE WITH SKYDROL)
Sand & Dust	12	D
Fungus	13	F
Salt spray	14	S
Power input	16	B
EMI	17	A
	18	A
	19	Z
	20	V
	21	Z
Lightning	22	Level 3
	23	2A per FAA advisory circular, AC-20-136
Icing	24	B
Electrostatic discharge	25	A

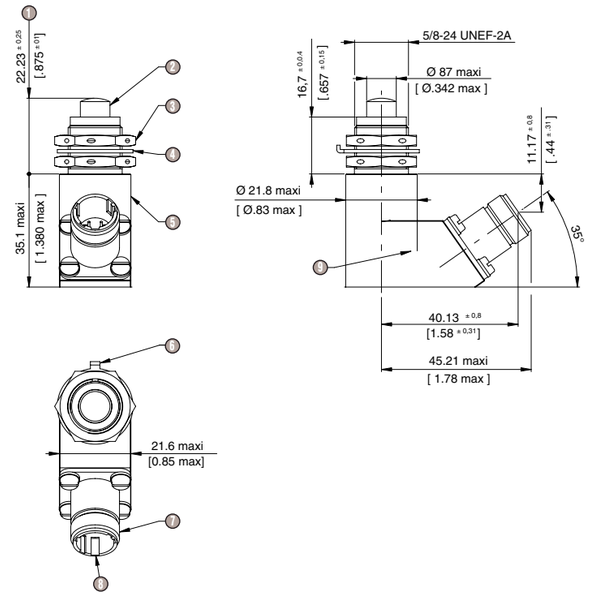
Electrical characteristics	
Open circuit voltage	9 to 17 VDC
Closed circuit current	2 to 20 mA
Open circuit resistance	1 MΩ min
Closed circut resistance	10 Ω max
Bonding resistance: between connector and body contacts: gold, hermeticaly sealed	2.5 mΩ max
Insulation resistance: between the connector pins connected together and the case	>100 MΩ
Dielectric strength: between the connector pins connected together and the case	I < 1 mA 500 VRMS-60 Hz/1 min

Mechanical characteristics	
Number of total cycles head on	80 000
Contact speed	20 in/s Max.
Release speed	20 in/s Max.
Pre-travel	0.040 in Max.
Differential travel	0.020 in Max.
Overtravel	0.125 in Min.
Operating force	6-12 lbs
Overtravel force	20 lbs Max.
Weight	0.38 pounds Max.

Principles



Dimensions (mm)



1. Free position: 22.23 ±0.25 [.875 ±.01]
2. Stainless steel plunger
3. Nut Qty 2 MS21340-05 or equivalent
4. Locking washer MS25081 C5 or equivalent
5. Stainless steel body
6. Lug angular position: ±10°
7. Connector: EN2997-Y00803M6
8. Master keyway angular position: ±15°
9. Marking aera

CUSTOMIZED PRODUCTS

LIMIT SWITCH
FOR HELICOPTER FOLDING TAIL FUNCTION

Specifications

Part numbers **DDP990196**

Environment characteristics

Condition	Normes	Method	Procedure
Temperature	MIL STD810E	501-3 502-3	I & II
Sand and Dust	MIL STD810E	510-3	
Salt fog	MIL STD810E	509-3	I
Humidity	MIL STD810E	507-3	I
Altitude	MIL STD810E	500-3	I & II
Acceleration	MIL STD810E	513-4	3.5 G/3 axis
Shocks	MIL STD810E	516-4	I
Fluid susceptibility	RS S623 A5901 E01 ISSUE A	§3332	
Vibrations	MIL STD810E	514-4	
Rain	MIL STD810E	506-3	III
E M C	N/A		
Indirect lightning	N/A		
Induced signal susceptibility	N/A		
Solar radiation	MIL STD810E	505-3	I & II

Electrical characteristics

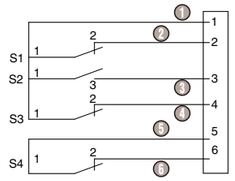
Rated voltage	28 VDC
Max. current (Resistive)	4 A
Max. current (Inductive)	2 A
Insulation resistance	≥ 100 MΩ

Mechanical characteristics

Forces and travels for altitude from -150m to 4000m and for operating temperature

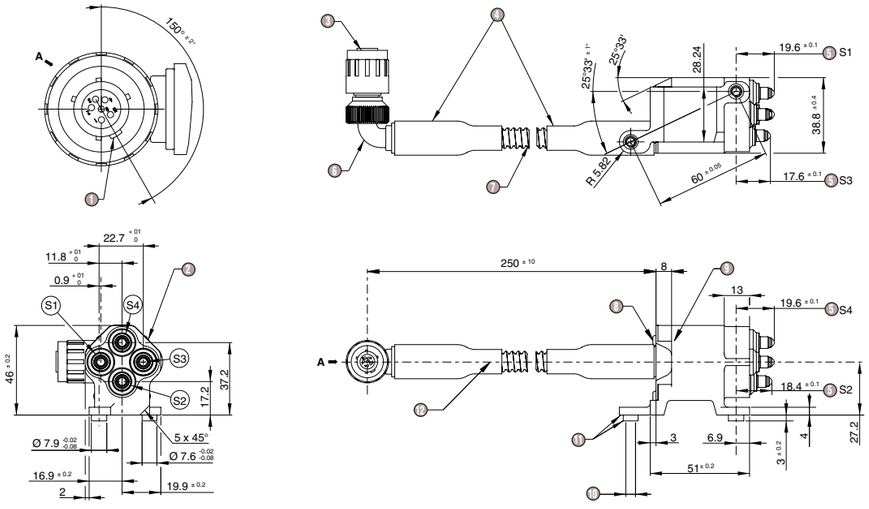
Max. Operating force	25 N
Min. Release force	5 N
Max. Pre-travel	0.5 mm
Max. Differential travel	0.05 mm
Min. Overtravel	3 mm
Operating temperature	-55 °C to +90 °C
Weight	245 g max
Attack angles	25° max
MTBF	5000 Fh

Principles



1. Common
2. NC Folded/Unfolded position
3. NO Tail in position
4. NC Tail out position
5. Common
6. NC Unfolded position

Dimensions (mm)



1. Master keyway
2. Body and cap 6061 ASN
3. Connector E0545J09-35XC
4. Boot VG95343T18A001A (202K132-25/225-0)
5. Si tripping point
6. 90° elbow union E0762W09-05BS
7. Flexible helicol ETFE tubing ASNE0637A08
8. 4 CBL «TORX» screws (bichromate steel)
9. Marking location
10. Heli-coil type screw lock M5
11. 1 face and 1 ø protection Alodine 1200
12. 6 AIR 1710-04 AWG 22 wires

LIMIT SWITCH

FOR THRUST REVERSER DOOR UPPER SECONDARY LOCK FUNCTION

Specifications

Part numbers **DDP770353**

Environment characteristics		
Condition	**RTCA/ DO-160D**	**Requirements**
Equipment intended for installation in powerplant	Section 4.3	Category D3
Operating low temperature	Section 4	Category D3 -40 °C
Operating high temperature	Section 4	Category D3 +135 °C
Short time operating high temperature	Section 4	Category D3 +135 °C
Ground survival low temperature	Section 4	Category D3 -62 °C
Ground survival high temperature	Section 4	Category D3 +85 °C
Altitude	Section 4	Category D3 45000 ft
Temperature variation	Section 5	Category A
Humidity	Section 6	Category B
Operating shock	Section 7	Category B
Crash shock	Section 7	Category B
Vibrations	Section 8	Category H2
Explosion	Section 9	Category E2
Waterproofness	Section 10	Category R
Fluid susceptibility	Section 11	Category F spray test
Sand and Dust	Section 12	Category D
Fungus resistance	Section 13	Category F
Salt spray	Section 14	Category S
Lightning induced transient susceptibility	Section 22	Category A4XX
Icing	Section 24	Category B

Electrical characteristics	
Normal operating voltage	28 VDC
Maximum operating voltage	32 VDC
Normal operating current	10 mA < I < 50 mA
Maximum operating current	100 mA
Resistance of contact	85 mΩ Max.
Dielectric withstanding at atmospheric pressure	1 000 V rms 1 mA
Electrical bonding	2.5 mΩ between the bush and the beginning of the shield under the sleeve
Insulation resistance	100 MΩ 500 VDC
Electrical lifetime	100 000 cycles
Contact bounce (checked during shocks and vibrations tests)	<5 ms

Mechanical characteristics

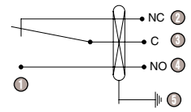
The characteristics are given for standard temperature (23 °C) and atmospheric pressure at the sea level (760 mm hg).

Braided shield grounded to body of switch for 360°.

Operating force	to be less than 12 lbs
Pre-travel	0.04 inch max
Differential travel	0.02 inch max
Overtravel	0.125 inch min
Mechanical lifetime	100 000 cycles
Weight	120 g Max.
Operating attack speeds	0.5 m/s Max.
Outstanded max. attack speeds permitted	0.7 m/s
Product sealing	Watertight
Cell sealing	Hermetic

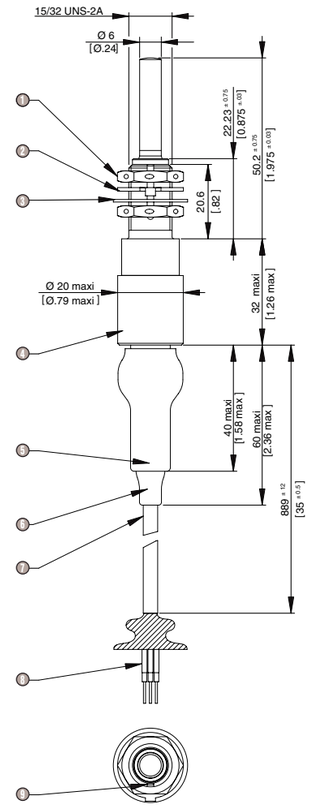
Principles

Circuit diagram (switch show in free position)



1. Gold contacts
2. Red 1
3. Blue 2
4. Yellow 3
5. Case Ground

Dimensions (mm)



1. Hex nut MS21340-04
2. Keying washer MS25081-C4
3. Flat washer MS9549-14
4. Laser marking
5. Heat-shrinkable boots
6. Sleeve DR25
7. 1 cable per MIL27500-20RC3N06
8. Sleeves marks
9. Keyway to within .25 of shoulder .072 ±.004 wide X .031 ±.003 deep.

CUSTOMIZED PRODUCTS